GAZETTEER

OF THE

PROVINCE OF SIND.

COMPILED BY

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[redacted]

PREFACE.

The Province of Sind has made great progress in many directions during the thirty-one years that have elasped since the 2nd edition of the excellent Gazetteer compiled by Mr. A. W. Hughes was published, and the need for an entirely new work has been felt for some time. Sir Evan James, during the nine years (from 1891 to 1900) in which he was at the head of the Province, took a keen interest in this matter and, though financial difficulties prevented the work being actually set on foot in his time, he made preparations and issued orders which resulted in the collection of some useful information, chiefly of an archaeological nature. At length, on 15th November, 1904, Mr. B. A. Brendon was appointed to compile six District Gazetteers of Sind, for which some materials had been collected in connection with the revision of the Imperial Gazetteer of India. The majority of the statistical tables had, in fact, been prepared and were supplied to Mr. Brendon by the Provincial Superintendent of Census, Bombay. Mr. Brendon's instructions were to prepare the Gazetteer for each District in two volumes, distinguished as A and B, of which the latter was to consist of statistical matter only, which might be revised and brought up to date periodically, while the A volume was to contain all matter of a more permanent character. The order and arrangement of the subjects to be treated was sketched out on lines similiar to those of the District Gazetteers of the rest of the Presidency. The first year was occupied principally in the collection of the very various detailed information which the scheme required, but Mr. Brendon had made good progress with the writing of the volume for the Hyderabad District when, unfortunately, he was obliged to leave for Europe suddenly on medical certificate and I was ordered to take temporary charge of his office. Eventually I was relieved of my own duties and appointed to complete the work. As the work proceeded it became clear that, in Sind, the plan of having a separate volume for each District would involve excessive repetition, and Government sanctioned a departure from that plan and the preparation of one A volume for all Sind, with six B volumes containing, besides the statistical tables, matter of local rather than general interest and such as was likely to require periodical revision. To the B volume it was decided also to relegate the descriptions of places of interest, simply because, in the case of most of them, materials are not yet available for such an account as a Gazetteer ought to supply. The descriptions of tombs, temples and ruins given in the accompanying B volumes must therefore be regarded as merely notices designed to stimulate further research.

The change of plan has made it possible to treat many subjects in a much more complete and satisfactory manner than would have been compatible with separate accounts for the six Districts, while it has greatly reduced the bulk of the whole work. But it has involved much re-arrangement of matter and the recasting of nearly all that had already been written, and therefore it seems only fair to my predecessor to say that, while the labour of collecting and arranging the mass of details required for this volume fell on him, and while much that was written by him is embodied in it, I am solely responsible for it in the form in which it now appears.

That the A volume is one and permanent, while the B volumes are six and temporary, has created a difficulty about the Index. It is hoped, however, that the full Index at the end of this volume and the list of Places of Interest in the last chapter, together with the alphabetical arrangement of those places in the B volumes and the detailed tables of contents, will enable the reader generally to find what he may be in quest of, *if it is in the book.* That there must be many omissions and many faults more serious than those of omission no one knows better than the compiler, who has been obliged to bring his work to a close just when his apprehension of how it ought to be done was maturing. The casual reader will hardly appreciate the loss resulting from "break of gauge," when one, who has collected and digested all the materials, hands them over for compilation by another who has done neither.

Ungrudging assistance has been received from district officers of all departments, from officials unconnected with this Province and from private persons. To three gentlemen I am especially indebted for able contributions on subjects which I was not competent to handle. They are Mr. Ernest W. Vredenburg, Deputy Director of the Geological Survey of India, Mr. T. R. Bell, Deputy Conservator of Forests, and Mr. F. L. Sprott, Superintending Engineer, Indus River Commission. To others Mr. Brendon and myself owe an acknowledgment of assistance which went beyond the courtesy shown by all in supplying official information. Major Pottinger, R. F. A., collected a large quantity of illustrative fossils for the paper on Geology. Mr. H. C. Mules, Mr. E. L. Sale, Mr. J. Crerar, Mr. A. B. DeSouza, Mr. J. Forrest Brunton and several others supplied much information on various subjects of which they had special knowledge. Of those whom Mr. Brendon consulted on the subject of native castes and customs, I believe that Rao Bahadur Kauramal and Mirza Kalichbeg Fredunbeg laid him under special obligation.

To Mr. John Murray of Albemarle Street, London, I am personally indebted for his courtesy in allowing me to make use of the excellent map of Karachi published in his Handbook for India, Burma and Ceylon.

KARACHI, *23rd April 1907.* E. H. AITKEN.

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CHAPTER I.

Description.

SIND anciently meant the valley of the Sindhu. How the name got converted to Indus has perplexed the learned, but the letter S is very elusive and there are many in Cutch who cannot pronounce it to this day: they turn it into an aspirate. The old Buddhist town of Supara near to Bassein has been conjectured, with much probability, to be the Ophir of Scripture, and it would be easy to cite other examples. Sindhu, or Indus, the great river annually flooded and made fertile a long plain isolated by a boundary of high mountains on the west and a vast desert on the east, and this plain was "Sindh." The limits of the province now include portions of both these boundaries and extend from 23° 35′ to 28° 30′ North Latitude and from 66° 42′ to 71° 10′ East Longitude, enclosing an area of 46,944 square miles exclusive of the territory of H. H. the Mir of Khairpur, which measures 6,050 square miles. They are bounded on the east by the native states of Márwár, Jaisalmer and Baháwalpur; on the north by a small corner of the Punjáb and by the level and sandy portion of the territories of the Khán of Kalát known as Kachhi; on the west by the mountainous part of the same territories, the boundary line running along the ridge of the Khirthar Range and the Habb river; and on the south by the Arabian Sea and the Rann of Cutch.* In the geography of popular speech Sind has three divisions, *viz.*, *Siro*, corresponding to Upper Sind; *Vicholo*, from a point about half way between Lárkána and Sehwán to Hyderábád; and *Lár*, the descending country from Hyderábád to the Sea. BOUNDARIES AND AREA.

The valley of the Indus is for the most part perfectly flat and very verdant. The nature of the verdure varies. The banks of the river and its distributaries support forests of babul and other trees and tamarisk, irrigation produces crops of cereals, PHYSICAL ASPECTS.

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* Kachh, or Kachha, and Kachhi, mentioned above, are the same word and indicate any region consisting of "raw," alluvial ground. It is therefore necessary to distinguish the country generally written *Cutch* in English atlases and maps.

PHYSICAL ASPECTS.

pulses, oil seeds and cotton, while lands which are periodically inundated but not cultivated cover themselves speedily, if allowed, with impenetrable thickets of tamarisk and mimosas, or with the white poplar and other trees, or with rank grasses, according to their situation. There are, however, extensive tracts, known as "pat," in which the soil is too dry, or too strongly impregnated with salt, to allow of much vegetable life. The hills are stony and barren to the view, but support a characteristic vegetation and afford grazing to large herds of cattle, sheep and goats. The creeks on the coast are fringed deeply with mangrove. The desert to the east presents an unbounded expanse of sandhills in parallel rows, like the waves of a troubled sea, but sustains a variety of camel and cattle fodder which belies its designation. A special feature of the scenery of Sind is the number of its tanks or marshes, called *dhands*, populous with wild ducks, geese and other water-fowl. The greatest of them is the famous Manchhar Lake in the Lárkána District. These features are described with more local details in the B Volumes for the several districts.

HILLS.

The hills of Sind consist of the Khirthar Range to the west, with the Laki Range south-east of it and the groups of smaller hills which extend from them into the Karáchi and Tatta Talukas; a detached Range running south from Sukkur and Rohri; and the isolated hilly country in the extreme south-east corner of Sind called Nangar Párkar. The line of low hills on which the town of Hyderábád stands is an out-crop of the first-named group. The Hala mountains, now named by the Geological Survey Department the Khirthar Range, commence just beyond the north-west corner of Sind, about 27° 55′ North Latitude, and run southwards, along the western frontier of the Province, to about 26° 15′, where they turn a little to the eastward and terminate in the Kohistán Mahal about 25° 43′. The total length of the range is 150 miles and its general height west of Lárkána between 4000 and 5000 feet above the sea, but isolated peaks rise to nearly 7000. Two heights on which it was proposed to build sanitaria are described in the Volume for the Lárkána District. South of the latitude of Sehwán it falls considerably in height. The Laki Range commences close to the Indus, which washed the feet of its hills 50 years ago, and not far from the town of Laki

in the Manjhand Mahal of the Kotri Taluka, whence it runs nearly due south for a distance of 80 miles. Near its northern extremity it attains an elevation of 1,500 feet. All these hills consist mainly of limestone, as does most of the hilly ground which forms a continuation of them to the south-east and south-west as far as the latitude of Karáchi. A more exact description of them is reserved for the article on Geology and the descriptive chapters in the B Volumes. The Rohri hills belong to the same system. Sukkur, the island fortress of Bukkur and the old town of Rohri, standing on detached heights of this chain, present perhaps the prettiest prospect that Sind affords. The range is 18 miles in length and attains an elevation of 480 feet above the sea, or 300 above the plain. HILLS.

Besides the Indus, which will be fully described further on, the Habb is the only permanent river in Sind, and only the left bank of it belongs to the Province. Numerous torrent beds, known as *Nais*, drain the hills after rain, discharging their waters into the sea, the Indus, or the Manchhar Lake and other *dhands*. The volume of water brought down by some of these, the Barán for example, which discharges into the Indus near Kotri, or the Malir, which enters the Ghizri creek, is at times so great as to waste the low-lying country through which they flow, and all of them are turned to account by damming their water for purposes of irrigation. But their importance is local and more particular accounts of them will be found in the B Volumes of the districts to which they belong. RIVERS.

An account of the rivers of Sind would, however, be incomplete without mention of the Eastern and Western Nárás. The former for part of its course runs in the bed of the "lost river" about which there have been so many theories. One is that it was the Satlaj, which some centuries ago forsook its original bed not far from where it leaves the mountains and, turning westward, effected a junction with the Biyah, thus adding a large volume of water to the already over-charged channel of the Indus and condemning to sterility a wide tract of country once fertile and populous.* In the map illustrating Thomas Pennant's quaint and learned View of Hindoostân (1798) this river is shown as

*See Calcutta Review, No. CXVII, Vol. lix, 1874, "The Lost River of the Indian Desert."

RIVERS.

rising in the Himalayas east of the "Setlege" and flowing down past the town of "Ammercot" into the Gulf of Cutch. It is there called the Gaggar river, which may be a corruption of the Hakra, the name still applied to parts of its ancient bed. Long after it ceased to be an independent river, its bed, under the name of the Nára (= Nala), served as a channel by which the flood waters of the Indus were guided down to the Dhoro Purán ("ancient channel" of the Indus) and so into the Kori creek. In 1857 it was converted into a canal by the opening of a controlled channel between it and the Indus at Rohri (See Irrigation).

The Western Nárá, which is also now a canal, was evidently at one time a loop of the Indus, the waters of which, leaving the main bed above Lárkána, took a course more or less parallel to it, which led them into the great natural depression that forms the Manchhar Lake. Another body of water poured into this depression through a channel leaving the Indus south of Sehwán called the Aral river; but when the inundation began to subside, this river flowed the other way, discharging the Manchhar into the Indus. As the retreat of the Manchhar water exposes about 20,000 acres of the richest land for cultivation in the cold season, the proper regulation of the Aral is a matter of very great concern to the Irrigation Department. A description of the Manchhar Lake, which is justly considered one of the sights of Sind, will be found in the B Volume for the Lárkána District.

The Rann (or Run: in Sind it is pronounced *Ryn.*) of Cutch forms the southern, or south-eastern boundary of Sind from Ráj-putana to the sea and it is difficult to understand the history of the country without bearing in mind the great changes which have come about in that tract. It is now a vast salt waste, flooded to a great extent for several months of the year by the waters of the sea driven into it by the force of the south-west monsoon, which convert it into a salt lake. At other seasons it is a desert, flat, firm and quite bare, except on a few "islands", where there is scanty herbage. *Chinkara* and the wild ass roam over it, crossing the border only to feed. But reasons are not wanting for the belief that, when Alexander the Great was in Sind, it was an inland sea, or lake, fed by the "lost river" and

afterwards by the Purán. More recently the western part at least of the Rann, from Ali Bandar to the Kori creek, was richly fertile, according to tradition, and intercourse between Sind and Cutch was free and frequent, obstructed by no desert barrier. In fact, there was probably a good water-way by the Purán from Lakhpat to Umarkot. About 30 miles from Lakhpat and 20 from Ali Bandar was the fort of Sindri, a frontier post and custom house of the Cutch government. Rahimki (more correctly Raomki) Bazár was another frontier town. But in 1762, or thereabouts, Ghulám Sháh Kalhora built a great dam across the Purán at Mori which served two purposes, fertilising his own lands and desiccating those of his enemy the Rao of Cutch. The Kori became a mere creek and Lakhpat the furthest habitable point of Cutch. Then the terrible earthquake of 1819 completed the work of desolation. A sudden subsidence of the land caused an inrush of the sea, which converted the country round Sindri into a salt lake for the time and destroyed that place. A sketch of Sindri, taken by Captain Grindlay in 1808 and published by Alexander Burnes in his Travels into Bokhara, shows a square fort, with a high round tower at one corner, situated on the bank of a large river with boats sailing up it. Since the earthquake the frontier of Sind, from the Kori creek to Nangar Párkar, has been an unmitigated saline desert, and the frontier towns, like Raomki Bazár, have dwindled away. RIVERS.

From time immemorial Sind has depended for its fertility on floods. As the river rose in the beginning of the hot season, it regularly surmounted, or breached, its banks at certain weak points, letting loose a great volume of water, which took its own course to the sea, submerging all the lowlands on its way. Thus one deluge left the Indus regularly in Baháwalpur territory and flooded all the eastern half of what is now the Sukkur District; while another left the right bank between 20 and 30 miles above Sukkur and, after traversing the Shikárpur Taluka, fed the *dhands* in the Larkána District, or found its way to the Manchhar Lake and so back, by the Aral river, to the Indus. Further north, in the Upper Sind Frontier District, the overflow of the Indus was often supplemented by floods from the northern hills, with serious results. Towards the south, and especially in the Delta, these distinct flood courses gave place to a general inundation, the river FLOODS.

FLOODS. rising everywhere above the level of its banks and laying the surrounding country under water. From a very early period local rulers and enterprising communities and individuals raised protective embankments and dug canals; but under the divided and unsettled governments to which Sind has been subject for centuries any comprehensive scheme for superseding uncontrolled by controlled irrigation was impossible. What has been done in that direction under British rule belongs to Chapter VI. See also notes on Floods in the B Volumes.

CLIMATE. One description will not cover the climates of Sind. On the coast extremes of heat and cold are unknown, the air is moist and the climate on the whole resembles that of Bombay, though it is better all round and much colder in the winter. In the north the conditions of the Central Indian plateau are exaggerated: Jacobábád is the hottest registering station on the list of the Meteorological Department and also the coldest in the Bombay Presidency. The scanty and precarious allowance of rain which Sind receives is unevenly distributed, the desert, strange to say, receiving most and the Lárkána District least. As, however, the climate of each district is examined in detail in the B Volumes, it is unnecessary to say more here.

EARTHQUAKES The whole of Sind is liable to seismic disturbance, more especially the eastern desert and the southern talukas of the Hyderábád and Karáchi Collectorates; but since the earthquake of 1819, which is said to have caused extensive changes in the Delta, no severe shock appears to have been recorded. There was one about 8 o'clock on the morning of 15th October, 1898, which was felt from Sháhbandar to Khairpur and all through Thar and Párkar, but it was nowhere severe, though the fall of some old walls and houses was hastened by it. Very slight shocks followed at intervals for some months. On the 14th of January, 1903, a sharper shock, accompanied by a loud rumbling, was felt throughout Thar and Párkar and in the south of the Hyderábád District, where it had some remarkable effects. At several places in the Badin Taluka fissures appeared in the ground, out of which warm water and mud surged, or spouted, in such volume that in one place not less than a square mile of the surrounding land was inundated. This irruption lasted for 12 hours or more, and when it subsided, geyser-like blow-holes were left of various sizes

from a few inches to 15 or 20 feet in diameter and at least 8 or 10 feet in depth, with a bottom of soft mud. A similar occurrence in connection with the great earthquake of 1819 is recorded in the Transactions of the Bombay Geographical Society, Vol. x, p. 152:—"Near the town of Sinderee, situated where a branch of the Indus joins the Rann, and which was permanently submerged on the occasion, a number of small cones, six or eight feet in height, burst up from the ground and continued for many days to emit bubbles of air and mud from their summits." In the same paper it is stated that in October, 1849, "something like an ebullition of pestilential gas, the discharge probably of a sub-marine volcano, occurred off Porebunder in Kattywar and was manifest 30 or 40 miles out to sea: the fish were poisoned by it and for days lay floating in myriads on the surface of the water." The last mentioned phenomenon, whatever may be the cause of it, is common. In May, 1905, dead fish were washed up at Clifton beach in such incredible quantities that they formed a deep, thick layer, from 5 to 10, or 15, feet wide and several miles long. The mud volcanoes of Las Bela are well known. EARTHQUAKES

CYCLONES. Prior to 1902 it was the vaunt of the citizens of Karáchi that their city lay outside the track of cyclones, a delusion which was shattered in that year by two successive visitations which appear to be unparallelled in the history of Sind. The first occurred on the 13th of May. At 3 in the morning of that day a cyclone crossing the Arabian Sea struck this coast and, travelling in a north-easterly direction, swept the whole district, sinking boats, blowing trees into the air, razing houses to the ground and destroying whole villages. The rain was not excessive, not more than 4 inches falling anywhere, but it sufficed to bring down torrents from the Kohistán hills which swept the plain and, attacking the railway near Dábeji station, breached it so effectually that traffic was entirely suspended from 13th to 17th May. Telegraph posts, roadside trees and gardens were levelled. The loss of life was heavy. In the Sháhbandar Taluka alone 225 persons were reported to have been drowned. Thousands of cattle and sheep suffered the same fate. In the town of Karáchi the damage done was not very great and no lives were lost.

The second cyclone came exactly one month after the first and blotted out the recollection of it. It commenced with squally

CYCLONES. winds and extraordinarily high tides on the 13th of June, increased in violence next day and raged from the morning of the 15th till noon of the 17th with a fury which could not be measured because the anemometers gave way when the wind reached a velocity of 100 miles an hour. Strange to say, the loss of life was small in comparison with that occasioned by the previous cyclone, the recollection of which had made the people more alert to escape while they could. The floods also were less destructive. Nevertheless thousands of cattle and sheep perished. But the town of Karáchi and its harbour appear to have borne the chief brunt of the storm and more damage was done by the sea than by wind or rain. The tide rose on June 16th to a height of 7 feet 2 inches above that predicted in the published tide tables and 3 feet above the highest level previously recorded, while terrific waves from the ocean rolled in, sweeping before them everything that could give way. The sandy ridge which forms the barrier of the upper part of the harbour against the Arabian Sea was reduced by 5 feet for a distance of about 6 miles and the waters overflowed the whole, wiping out the village of Bhit, the inhabitants of which were gallantly rescued by the Tindal of the water-boat Jumbo. On both sides of the harbour piers were wrecked, stone-faced embankments breached, or washed away, and the railway lines on them left exposed and unsupported. The sheds in the Import Yard were extensively unroofed and one of the ventilators, weighing between 2 and 3 tons, was blown across a wide road into a neighbouring timber yard. The city was partially flooded and the whole country for miles around was submerged. The native craft in the harbour were carried far inland and one large Kotia remains to this day where its proper element abandoned it in the midst of a wide sandy waste. Only nine lives appear to have been lost in the city. The fury of this storm seems to have been intensely concentrated within narrow limits. It did no damage in Hyderábád and was scarcely noticed further north. It is worth noting that in June, 1883, the southern part of the Sháhbandar Taluka was swept by a tidal wave so sudden and unlooked for that it carried away 92 persons, mostly women and children. The loss of camels and cattle was very great. This wave was also associated with a storm, but may have been the result of an earthquake.

The River Indus.

The Indus.

The classic name of the river Indus was *Sindhu,* Sanskrit for an ocean, (the modern dweller on its banks uses the Persian equivalent, *Darya*) and Sindh was the country created and sustained by the river, without which it would be a Sahara. Its length is about 1800 miles and for nearly a third of that (580 or 590 miles) it traverses the Province and annually, when the snows at its source begin to melt with the advance of spring, rises and overflows its banks and floods the low-lying country far and wide. From time immemorial its superabundant waters have been restrained and directed by the art of man, as narrated in the section on Canals. Here space must be found for an account in some detail of the river itself.

CHARACTERISTICS OF THE INDUS.

Its most noticeable characteristic is the extent and rapidity of the changes that take place in its course. There are in the whole of Sind only two really stable portions, the first the gorge at Bukkur and the other at Kotri. Even in these there are frequent changes taking place, changes which prevent an estimate being formed, with any reasonable degree of accuracy, of the discharge of the river at any given stage.

The reason for this instability is threefold:—

1st.—The soil over nearly the whole of the Indus valley is extremely friable and easily disintegrated by the flow of water, in consequence of which the impingement of the current against a bank at even a low velocity is sufficient to cause its rapid erosion. The result of this friable nature of the soil and its extremely finely divided state is that the water always has a large amount of silt in suspension, which in any places, where the volocity falls below what is required to transport it, begins to fall and rapidly forms banks and shoals.

2nd.—The fall of the country is fairly rapid and consequently, in order to keep the velocity within the limits that can be borne by the banks without considerable erosion, the river is compelled to work out for itself a very tortuous course.

The following figures show roughly the ratio of tortuosity in different sections of the river compared with the distance measured

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direct between the places named:—

CHARACTERISTICS OF THE INDUS.

	Direct. Miles.	By River. Miles.	Ratio.
Kashmor to Sukkur ...	... 73	109	1 to 1·49
Sukkur to Sehwán ...	... 105	169	1 to 1·61
Sehwán to Kotri ...	... 76	114	1 to 1·50
Kotri to head of Delta	... 76	118	1 to 1·55

3rd.—The banks are very low and are in most cases over-topped during the inundation season. Owing to the tortuous course of the river it frequently happens that the distance across the neck of land separating two great bends is comparatively very short. The difference in level between the surface of the river on the two sides of this neck is that due to the distance round the bend. The river may then force its way through this neck of land and what is technically called a cut off eventually takes place, resulting in the shortening of the length of the river, possibly by some miles, a reduction in the ratio of tortuosity and an increase in velocity of the current beyond the normal. As the banks are unable to withstand this velocity, they are cut away in the endeavour to recover the normal ratio and heavy erosion is set up until such time as the river has recovered its normal length. The river generally speaking is board and moderately shallow, with one or more main channels (generally one only) of depth over the bars of from 4 to 6 feet at low water, the pools lying alternately on either bank with a shallow bar or crossing between. Its breadth in the cold weather may be anything from 1000 to 4000 feet, while during the inundation it spreads over the banks and is only retained by the *bands,* or high ground, on either side, and may thus be several miles in breadth.

SILT.

The Indus water is always highly discoloured with silt, the proportions of which however vary very largely. The following are results:—

	Sukkur Grains per cubic foot.			Kotri Grains per cubic foot.		
	1902.	1903.	1904.	1902.	1903.	1904.
Average whole Year ...	1237	1372	1175	1319	1517	1416
Maximum	2647	2600	2400	2360	3340	2880
Minimum	150	150	230	70	10	320

It is estimated that about 285 million tons of silt passed Sukkur and 271½ million tons passed Kotri in 1902, that in 1903 these figures reached 443 million tons and 426 million tons at Sukkur and Kotri respectively, and in 1904 the figures were 333⅔ and 331⅓ million tons respectively. Allowing for the draw off from channels, this indicates that the *regime* between Sukkur and Kotri was fairly steady, perhaps with a slight tendency to erosion of the river bed. How much of this silt is deposited and not again eroded between Kotri and the sea is not known, but as the surface fall of the river and hence the velocity is much decreased below Kotri, it is probable that a considerable portion of it is annually deposited; this receives confirmation from the substantial rise that has occurred in the flood levels at Jerruck in the last five years, a rise which is not found either at Bukkur or Kotri. A comparison of the maps of the coast line shows that an accretion of about 97 square miles has occurred in front of the mouths of the Indus between 1873 and 1904. **The Indus.**

In spite of the quantity of earthy matter in it, the water of the Indus is universally drunk without injurious result, for though there is a notion in some parts that it is conducive to the formation of stone in the bladder, there is no evidence in favour of such a supposition. Before drinking it the people commonly give it some time to settle, or stir it with a bruised almond kernel, which appears to act in much the same way as alum. QUALITY OF WATER.

The observed mean velocities at the Sukkur and Kotri gauging stations are as follows:— VELOCITIES.

	Sukkur.		Kotri.	
	Maximum.	Minimum.	Maximum.	Minimum.
	Feet per second.		Feet per second.	
1901	10·15	1·90	8·16	1·89
1902	8·20	1·88	7·02	1·39
1903	9·18	1·75	7·57	1·80
1904	8·90	1·19	8·23	1·41

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These observations give the mean velocity for the whole of the discharge section and do not represent the absolute maximum and minimum on any particular portion of that section. Observations made in 1904 show an absolute maximum of 10·75 feet per second at Kotri and 10·35 at Sukkur. The discharge section at Sukkur is some distance below the gorge, where the velocity is much higher, probably reaching 13 feet per second.

VOLUME OF WATER.

There are permanent gauges at the following places only, Sukkur (Bukkur and Din-Belo and two temporary gauges at Gaughat and Outfall), Kotri and Jerruck.

The following figures are interesting:—

Commencement of Irrigation season 15th June.

Average height on that date (10 years) :—

Bukkur 10·4. Average discharge 222,000 cusecs.

Kotri 13·7. Average discharge 199,000 cusecs.

Maximum of 10 years average occurs on 11th August at Bukkur, height 13·9, discharge 455,000 cusecs; and on 22nd August at Kotri, height 18·5, discharge 393,000.

The actual maximum height in the last 20 years gave a height of 17·92 on Bukkur and 22·0 on Kotri gauge. At that time no measurements of discharge were made. Actual maximum measured was 699,184 cusecs at Bukkur in 1901 with a gauge of 16·3 and 525,441 cusecs at Kotri with a gauge of 19·1, but discharges have only been regularly measured since 1901.

Actual minimum measured at Bukkur 18,947 cusecs in March 1903.

Actual minimum measured at Kotri 19,772 cusecs in March 1903.

Minimum of 10 years average occurs on 2nd January at Bukkur, height 0·5, probable discharge 28,000 cusecs; and at Kotri on 17th January, height 4·7, probable discharge 31,000 cusecs.

There are no data on which to base an estimate of the amount discharged into the sea, as discharges are only measured at Sukkur and Kotri.

The following tables show heights on certain dates for the last ten years:— **The Indus.**

BUKKUR.

	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.
15th June ...	12·42	9·42	8·67	10·00	10·10	11·00	8·00	11·60	10·50	13·00
Highest ...	15·25	15·75	17·92	13·40	13·40	14·50	16·40	13·50	17·10	15·80
15th Sept. ...	9·0	7·17	9·92	10·20	7·20	13·0	10·70	10·70	14·10	8·80
31st Dec. ...	0·33	0·08	0·67	0·30	0·20	1·85	1·40	1·90	2·00	2·20
Lowest ...	0·25	0·33	0·50	0·60	1·20	0·70	1·40	0·65	1·00	1·50

KOTRI.

	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.
15th June ...	15·50	14·83	14·00	12·08	13·30	13·50	13·30	13·10	12·50	14·80
Highest ...	18·50	19·42	22·00	18·58	18·60	19·20	19·50	15·90	19·70	18·70
15th Sept. ...	13·67	13·33	18·33	16·67	12·30	18·30	16·60	12·40	15·80	13·40
31st Dec. ...	5·90	4·83	4·80	4·20	4·40	5·30	5·60	5·30	5·90	6·70
Lowest ...	5·00	4·83	3·92	3·00	3·50	3·70	5·30	2·90	3·70	5·40

JERRUCK.

	1900.	1901.	1902.	1903.	1904.
15th June	9·30	9·40	9·10	9·00	10·40
Highest	15·10	16·00	12·30	14·90	14·40
15th September	14·30	12·80	10·00	11·20	9·30
31st December	2·65	2·60	2·30	1·80	3·50
Lowest	*2·65	2·45	0·20	0·50	1·80

* Doubtful as gauge established in May 1900 only.

In order to prevent excessive flooding the river is bunded in nearly all places where floods are liable to occur. BANDS.

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The principal *bands* are the following:—

Right Bank.

	Length Miles.	Average cost of maintenance. Rs.
Kashmor Band...	73	41,300
Sukkur Begári Band	46·5	6,300
Ghár Canals Bands	45·8	10,200
Nára Bands	77	16,500
Mánjhand Bands	5·75	1,600
Karáchi Canals Bands...	56	10,700

Left Bank.

Náich Bands	34	1,600
Kásimpur Band...	10·5	2,100
Small Bands north of Sukkur... ...	28·25	800
Naulakhi Bhorti Band	8·92	2,700
Fuleli Canals Bands	35·01	3,800
Karáchi Canals Bands	98	17,800

THE DELTA.

From the Kori creek, through which the Fuleli once found its way to the sea, to the creek which runs from Ghizri to Gháro, a distance of quite 125 miles, the whole coast line is scalloped with inlets of the sea, of which perhaps there is not one that has not been at some time a chief outlet of the Indus. Before the Fuleli was the Ren and before that the Purán. The Ren dried up about 150 years ago, when the Indus, leaving its old course, which passed near Nasarpur, took a sharp turn to the right and got on the west of Nerun (Hyderábád)*. Assistant Surgeon Heddle, reporting in 1836, stated that the branch which flowed north of Tatta to Gháro had been closed for sixty years. By this Tatta was thrown out of the Delta. Fifty years later the Baghár branch, now converted into a canal, silted up, and the apex of the Delta was pushed nearer the sea. The Pinyári is said to have been dammed first by the Mírs in 1799: at any rate it is effectually dammed now near Mughalbhin and is a canal pure and simple; so is the Fuleli. The mouths of others remain as tidal creeks connected with each other by cross channels, which form a network of navigable waters at high tide. The present head of the Delta may be placed at the bifurcation of the Ochito and the Haidari, about 139 miles below the offtake of the Fuleli. These

* See "The Indus Delta Country" by Major-General M. R. Haig, M.R.A.S.

two are the main branches through which the water of the river reaches the sea, the latter being at the present day by far the more important. They divide, however, into several creeks further down, of which the principal are the Turshian, Kalandari, Jong, Mutni, (Haidari), and Mull. The Sír creek may also be mentioned because on it is situated the port of Sírganda, the only port besides Keti Bandar (on the Ochito) on any of the mouths of the Indus; but very little water now finds its way by that mouth. **The Indus.**

In the old Gazetteer it is stated that the influence of the tides is felt almost as far up as Tatta. A few observations that have been made show that the tide does not now reach so far, and it is not much felt above the bifurcation, or the head of the Delta, a distance of about 42 miles below Tatta. It is believed that the effect is only from 3 to 6 inches at this point.

From the point at which it enters the Karáchi District to about the village of Hiláya the bed of the river lies through the limestone which forms the low hills of Jerruck that gird its right bank, and this gives a character of comparative stability to that part of its course. "When this section is entered," to quote Assistant Surgeon Heddle, "no difficulties are experienced in the navigation of the river, and were the whole line from the sea to Hiláya of the same character, the Indus would never have been so deserted as it now is and Sind, with the regions adjoining it, would have been at this day better known to Europeans than they are." But from this point the river travels through a peculiarly soft and friable soil, and extensive reaches of the banks, undermined by the current, fall, or slide in, at frequent intervals, with a terrifying noise. A very graphic account of this phenomenon is given by Mr. Heddle, which cannot be quoted here, but it is of interest to note that in this part of the Indus he seldom met with "the bark either of the fisherman or of the merchant." "The merchants of Tatta have abandoned the Indus and they now use the camel to transport their wares from Kurrachee to Shikerpoor and Hyderábád." Besides the danger to boats of being swamped by falling banks, the navigable channel was continually being changed by their action, and the closing of the Gháro, Baghár and other old beds has been attributed mainly to this cause. Further down the elephant grass (*Typha elephantina*, Sindhi, *Pan*) in many parts binds the soil with its far-reaching

The Indus. roots and effectually prevents erosion. Mr. Heddle found that the natives of the district were well aware of the services rendered by this grass and in cutting it for the manufacture of matting, an industry which then, as now, gave employment to a large section of the population, they cut the plants close to the soil but did not disturb the roots. Nearer the coast, in the tidal creeks and marshes, there can be no doubt that the same purpose is most effectually served by the Mangrove, (*Rhizophora mucronata,* Sindhi *Kandal*) and the white Mangrove (*Avicennia officinalis,* Sindhi *Timar,* or *Tiwar*) and much damage has been done by the unrestricted destruction of these for fuel. The wood of the latter furnished the best fuel obtainable for the river steamers in the early years of our rule. The foliage of it is excellent fodder for camels. Above the immediate influence of the sea Tamarisk (*Tamarix gallica* and *dioica,* Sindhi *Lai* and *Jhao*) appears and rapidly covers, if allowed, every newly exposed bank. The wood of this was also used by the river steamers. The *Shikárgáhs,* or hunting forests, of the Mírs consisted of tamarisk and babul, extending for more than thirty miles between Hiláya and Hyderábád, and beyond that again to near Sehwán, and the latter tree still clothes both banks of the river for a great portion of its length.

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Geology. A considerable part of Sind is a plain occupied either by recent alluvium or wind-borne sand. The principal features of geological interest are to be found in the hilly portions of the province, and therefore in the region west of the Indus. Outlying extensions of this hilly tract occur east of the Indus near Sukkur, Hyderábád and Jerruck. The isolated hills of Nangar Párkar on the northern border of the Rann of Cutch belong to quite a different system both geographically and geologically.

The hilly region of Western Sind consists almost entirely of rocks belonging to the Tertiary system of geological nomenclature. It is only along the Laki Range and in its neighbourhood that there are some exposures of rocks belonging to the next older system, the Cretaceous. With the exception of some volcanic beds associated with these Cretaceous strata, all the rock formations of Western Sind are of sedimentary origin. All the more important hill-masses consist of limestones. Besides these

limestones, there are important accumulations of other rocks, such as shales and clays and especially sandstones, but they are never so compact or massive as the limestones, and being more easily degraded by erosion, do not exercise such a decided effect upon the topography in spite of their vast thickness. Geology.

The most massive of these limestones, forming the great majority of the more conspicuous ranges, belong to the nummulitic period, and are largely built up of the accumulated shells of foraminifera, principally those belonging to the genus *Nummulites*, nowadays almost extinct, but which acquired a remarkable developement at the particular period of the world's history when the nummulitic limestones were deposited. The nummulitic strata in Sind are but a portion of a vast formation which extends almost uninterruptedly up to this province from the shores of the Atlantic along both the southern and northern borders of the Mediterranean, and which extends still further to the north-east through Baluchistán and along the Himalaya as far as Simla. The same formation is also developed in many other parts of the world.

The Khirthar Range, the Bhit and Badhra which flank it on the east, the Laki Range, including Daphro and Surjáno, the Bedur and Dambar ranges, the hills extending from Mánjhand to Jungsháhi, those of Rohri and Sukkur, of Hyderádád, of Tatta, in fact nearly all the most conspicuous hills of Sind, consist of massive nummulitic limestone. It is not of exactly the same age in all these hills. The Khirthar Range contains the newest strata, the Laki Range, the Tatta and Hyderábád, Mánjhand and Jungsháhi hills, and some parts of the Daphro and Surjáno ranges contain the oldest, while rocks of intermediate age occur in some parts of the Khirthar, Laki, Daphro and Surjáno ranges and form the totality of the remainder of those enumerated above.

All these limestones are crowded with nummulites belonging to various species, some of which characterise special horizons. It is these specific differences amongst the fossil contents of these massive limestones that have enabled geologists to recognise that the different exposures do not strictly belong to one age. They present, nevertheless, many common characters, great massiveness of bedding, a nodular structure and a very close-grained compact texture, very pale colours, pale grey or pale-buff or quite white,

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and the frequent presence of flint masses. Moreover, although belonging to different periods, all these are but subdivisions of one great geological group which was named by Dr. Blanford the Khirthar group, and which corresponds with the Lutetian of European nomenclature. It is *par excellence* the age of nummulites.

All these limestone ranges have an anticlinal structure; that is, the strata constituting them have been warped in such a manner as to constitute elongated corrugations whose transverse section has the shape of an arch. The ridges thus constituted do not diverge more than about 30° in either direction from an average north and south strike. The anticlinal arches are usually steepest towards the northern extremity of the ranges becoming gradually broader and lower as their southern termination is approached. The more westerly ridges are also generally much more abrupt than the eastern ones; the easternmost upheavals like the Sukkur, Hyderábád or Tatta hills, or especially the broad anticline of which the hills between Mánjhand and Kotri constitute the eastern border, exhibit the shape of very broad, shallow, elliptical, dome-shaped swellings.

The rocks resting upon the Khirthar limestone in the hollow troughs, or synclines, that intervene between these anticlinal ridges are soft shales and sandstones which have been completely removed by denudation from the roofs of the anticlines. Once this easily weathered covering has been removed from above the Khirthar limestone, denudation nearly comes to a standstill, for in an almost rainless country like Sind, the massive limestone successfully resists disintegration for an almost indefinite period. It is owing to these circumstances that the arched or dome shape of these ridges is often so apparent, accounting for the singular whale-back appearance which they sometimes exhibit. The drainage of these limestone hills collects in deep narrow gorges with precipitous sides, cutting like rifts across the ranges, whose smoothness of general outline is scarcely affected thereby.

These peculiar features are to a great extent dependent upon the great massiveness of the Khirthar limestones. Intercalations of more or less calcareous shales or clays do occur, but only locally and never of any great thickness. Beds of this nature occur along the western base of the hills south of Rohri, at

Dharan Lak in the Laki Range, near Hyderábád, near Jerruck and near Tatta. Geology.

Occasionally these shaly strata are associated with a kind of Fuller's earth which is locally extracted and for which there is some demand in the native bazárs.

These softer beds also contain layers remarkable for the abundant and beautifully preserved fossils which they contain. The massive limestones, although entirely made up of the remains of organisms, are so compact that the fossils cannot be extracted, or weather out only as unrecognisable casts. The rich fossil fauna locally obtainable in these softer beds contains, in addition to the characteristic foraminifera, chiefly nummulites and alveolines, numerous species of corals, echinoids, and mollusca, some of which have been described in the palaeontological publications of the Geological Survey of India.

There are three important outcrops of rocks older than the Khirthar group. Two of them, situated respectively to the north-west of Kotri and in the neighbourhood of Jerruck, consist of rocks of tertiary age, but belonging to an older division than the Khirthar or Lutetian; they constitute a geological division known in Sind as the Ranikot group, so called from a fort of that name situated in the Laki Range. The third exposure, along the Laki Range, also exhibits the Ranikot beds, and, underlying them, some strata of cretaceous age, the oldest anywhere exposed in western Sind. The Laki Range is a steep anticline whose symmetry has been disturbed by faulting: the pressure which folded the strata has acted principally from west to east in such a manner that the anticlinal arch has been broken and its western half forced over the eastern one. In consequence of this structure, the western portion has been raised to such an extent that a considerable thickness of strata underlying the Khirthar limestone has come to light. The lowermost beds, which are exposed only at Bárrah hill, 10 miles southwest of Amri, consist of hard calcareous sandstones and fairly massive limestones containing Hippurites, a characteristic cretaceous fossil shell. These are overlaid by a considerable thickness of sandstones of variable colour, but whose outer surface exposed to the atmosphere invariably weathers deep black. They are exposed at various places along the Laki Range from Jhakmari to Ranikot, forming

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hills conspicuous from a distance owing to their black colour. Overlying these black-weathering sandstones, there is a certain thickness of olive-coloured shales and brown sandstones and impure arenaceous limestones exposed along the escarpment of the Laki Range and also at some places west of these hills. These brown limestones contain a great abundance of fossils, principally a bivalve shell known as *Cardita Beaumonti* in consequence of which these strata are known in the geological nomenclature of Sind as the *Cardita Beaumonti* beds. All these strata are of cretaceous age and all are marine sediments. But, resting upon the *Cardita Beaumonti* beds, is a stratum of a totally different nature, a volcanic lava flow consisting of heavy dark-coloured basalt. It is a representative of the great volcanic formation known to geologists as the Deccan Trap, which is so largely represented in Peninsular India, where it constitutes the Sahyadri range and many other flat-topped hills. In the Laki Range it does not attain anything like the vast thickness which it exhibits in Peninsular India. It is only some forty feet thick and is succeeded by the sandstones of the Ranikot group. Unlike the marine cretaceous strata the lower sandstones of the Ranikot group are of fluviatile origin. The area which had been submerged during cretaceous times became dry land for a considerable period after the volcanic eruptions of the Deccan Trap. Consequently, there is a stratigraphical break between the Deccan Trap and the Ranikot.

At the close of this continental period there were local marine incursions of very short duration, which have left their mark in the shape of an oyster bank here and there resting upon the surface of the Deccan Trap. Then the sea-coast must have again receded slightly, for the land received fresh accumulations of strata, this time of fluviatile origin, constituting the Lower Ranikot. At Leilán, some twenty miles north north-west of Kotri, these strata contain an intercalated bed of lignite probably formed by the accumulation of vegetable remains in a lake or swamp not far removed from the sea-coast. Those lower Ranikot beds, whose total thickness may be 1000 to 1200 feet, consist principally of bright-coloured sandstones, which are very well exhibited in the tall scarps of the Laki Range and particularly in the great anticlinal valley of Ranikot. They also occupy a large area round Leilán in the centre of the great Ranikot outcrop north-

west of Kotri, where, however, their base is not exposed owing to the low angles of dip.

The deposition of the Upper Ranikot strata coincided with a decided return of marine conditions. They consist largely of limestones which, however, are never massive like those of the Khirthar beds, being largely interbedded with soft, more or less shaly beds. Their colour is usually dark brown and they are highly fossiliferous, containing a rich fauna of beautifully preserved corals, echinoidea, and mollusca. In age they mainly correspond with the well-known London clay. Their uppermost strata contain nummulites of species differing from those of the overlying Khirthar. One of these species, *Nummulites planulata*, is, in many parts of the world, the earliest species occuring in abundance.

Resting upon the Ranikot is the Khirthar group already described; but just as there is a break between the Deccan Trap and the Ranikot, so is there one between the Ranikot and Khirthar: between the deposition of these two groups of tertiary strata, the sea again receded and there intervened a continental era during which the Upper Ranikot beds were to a great extent redenuded. Consequently the thickness of the marine Ranikot limestones varies considerably from place to place. In the Laki Range only some feeble remnants occur here and there between the top of the fluviatile sandstones and the base of the overlying Khirthar, which often rests directly upon the Lower Ranikot in places where the entire thickness of the Upper Ranikot has been denuded away during the continental period that intervened between the Ranikot and Khirthar epochs. In the broad oval exposure north-west of Kotri the series is far more complete, especially in the southern portion of the outcrop, and it is the Jerruck outcrop still further south that exhibits the uppermost horizon most completely. It is only in the southern portion of the great outcrop north-west of Kotri, and in the Jerruck outcrop that the uppermost beds, those containing the nummulites, are exposed.

In addition to the stratigraphical breaks both above and below the Ranikot group, there are others at various horizons above the Khirthar, also caused by temporary land conditions. During these continental intervals the surface of the land often exhibited a tendency to weather into ferruginous laterite. These ferruginous

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lateritic beds almost invariably accompany the stratigraphical breaks in the geological sequence in Sind. Formerly they were quarried to some extent and used as iron ores.

The Ranikot and Khirthar groups both belong to the lower division of the Tertiary system, that known in geological nomenclature as the Eocene. The next two divisions, the Oligocene and Miocene, are represented in Sind by a vast accumulation of strata consisting principally of sandstones which, owing to their friability and consequent easy denudation, do not form any conspicuous orographical features in spite of their considerable thickness. These sandstones can be divided into two sections, a lower one called the Nári group, whose age is oligocene, and an upper one called the Manchhar group, mostly miocene. The Nári beds have been so called from their presence in the valley of the Nári river, which traverses some spurs of the Khirthar Range. The Manchhar beds take their name from the Manchhar lake, whose basin is occupied by beds of that formation. The lowermost and uppermost beds of the Nári often consist of fairly massive limestones. The lower limestones do not exercise any influence upon the topography because they rest immediately upon the massive limestones of the Khirthar group and therefore structurally coalesce with them, merely constituting an outer shell to the anticlinal domes of Khirthar beds. But the case is different with the uppermost limestones. These are known as Gáj beds, owing to their being well exposed in the Gáj river valley east of the Khirthar Range. The compact Gáj limestones have withstood denudation far better than the two great masses of soft sandstones between which they are intercalated, in consequence of which they form very well marked hills, though not so lofty as the far more massive Khirthar limestones. A conspicuous ridge formed by these rocks runs parallel to the Khirthar Range and at a distance of some two to five miles east of it. Its most conspicuous peaks are Amru (2716 feet) and Háshim in the Lárkána District.

The dip of the Gáj beds all along this range is to the east at a rather steep angle, which accounts for its abruptness and regularly rectilinear configuration. Between the valleys of the Hab and Báran rivers the beds are nearly horizontal and, instead of forming narrow ridges, they constitute broad plateaux, such as

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the ones known as Mol and Maihar. South-west of the Maihar plateau the dip of the strata again steepens so that the Gáj beds again assume the shape of a distinct range which terminates at Cape Monze. It is an extension of this particular outcrop that furnishes the building stone of Karáchi.

The softer beds of the Nári and Manchhar groups, respectively underlying and overlying the Gáj limestones, usually form low-lying areas, either quite flat or else occupied by series of parallel low ridges, of which one side is usually a "dip-slope" corresponding with the natural inclination of the strata, the opposite side being scarped and more abrupt. The predominating colour of these sandstones is grey; sometimes they assume bright colours, chiefly red, for instance west of Bhago Toro hill south-west of Sehwán. Conglomerates are frequently intercalated amidst these sandstones. The Nári sandstones are largely of marine origin, the Manchhar ones are fluviatile. Besides occupying the basin of the Manchhar Lake, the Manchhar beds form considerable outcrops east of the Khirthar and Laki Ranges. The Nári sandstones occupy most of the valleys intervening between the ridges of Khirthar limestone.

The calcareous beds in the upper and lower portions of the Nári abound in fossils. The lower limestones contain nummulites different from those of the Khirthar, the most frequent species being *Nummulites intermedia*, which, in Europe, as in Sind, distinguishes the newest beds characterised by the abundance of the genus. The upper calcareous beds, that is the Gáj limestones, contain no nummulites, but abound in corals, echinoidea and mollusca. The Nári sandstones intervening between the two limestone groups occasionally contain more or less calcareous intercalations crowded with large foraminifera of the genus *Orbitoides*, which also occur in the Gáj beds. The Manchhar beds are mostly unfossiliferous, though their lower strata contain sometimes detached teeth and bones of large mammalia such as *Dinotherium*, *Mastodon* and *Rhinocerous*, which characterise the older portion of the great Siwalik group in the Himalayan region. Not unfrequently the Manchhar sandstones contain numerous silicified tree trunks.

The isolated hill mass of Nangar Párkar on the northern edge of the Rann of Cutch belongs to quite a different geological series. It consists of granitic rocks, probably an outlying mass of

Geology.

the crystalline rocks of the Aravalli range. The Aravalli series belongs to the Archaean system which constitutes the oldest rocks of the earth's crust.

For fuller details, reference should be made to Blanford's "Geology of Western Sind" (Memoirs of the Geological Survey, Vol. XVII, part I.)

A large collection of fossils, including foraminifera, corals, echinoidea, bryozoa, mollusca and crustacea, gathered in 1845 by Captain Vicary, was described by d'Archiac and Haime in their classical work, "Description des Animaux fossiles du groupe nummulitique de l'Inde." The corals, echinoidea and crustacea and the mammalia subsequently collected by the Geological Survey of India have been described in the Palæontologia Indica published by that Department.

The following table summarises the main points of the geology of Sind.

Names of groups.	Constitution.	Mode of formation.	Approximate thickness in feet.
8.—*Recent* and *sub-recent.*	Indus alluvium, tufa deposits, deposits of the Rann of Cutch, blown sand, raised beaches, etc.	Fluviatile, sub-aerial, eolian.	Variable.
7.—*Manchhar*...	The lower and upper beds consist of grey sandstones associated with conglomerates; the middle portion of the group consists of clays, often coloured orange or brown, associated with sandstones.	Fluviatile ...	Nearly 10000
6.—*Nári*	Upper beds, chiefly calcareous, constituting the Gáj division.	Marine ..	1000 to 1500.
	Thick-bedded usually grey sandstones with subordinate bands of clay, shale, ironstone and conglomerate.	Largely marine; probably partly fluviatile.	4000 to 6000.
	Limestones, the lower beds often white and very massive, the upper beds usually brown and yellow, interbedded with thick bands of shale and numerous layers of sandstone.	Marine ..	100 to 1500.
5.—*Khirthar* ...	Massive white limestone...	Marine ...	2000.

FORMATIONS.

Principal exposures.	Characteristic fossils.	Geological age.
Alluvial plain of the Indus, desert of Eastern Sind, Thar and Párkar District, conglomerates of the plain north of Karáçhi.	Numerous animal remains, chiefly mollusca, all indentical with living species.	*Quaternary.*
The low ridges along the eastern foot of the Kirthar Range from the northern frontier of Sind down to the neighbourhood of the Manchhar Lake; the basin of the Manchhar Lake, the valley of the Bárán river from near Karchat to near Bula Khán's Thána; a broad undulating tract all along the eastern foot of the Laki Range.	Teeth of *Mastodon latidens*, *Dinotherium indicum*, *Rhinocerous palæindicus* and other mammalia found only in the lower conglomerates. Silicified wood.	*Miocene* and *Lower Pliocene.*
A discontinuous ridge parallel with the Khirthar Range and extending from east of Kutte-ka-Kabar to the borders of the Manchhar Lake depression; the Mol and Maihar plateaux east of the Hab valley, and most of the ridges east of the Hab to Cape Monze; the greater part of the western and southern portions of the Karáchi District.	*Breynia carinata*, *Echinolampas Jacquemonti*, (echinoids.)	*Oligocene.*
Lower slopes east and west of the Khirthar Range; valleys intervening between the Khirthar, Bhit, Badhra and Laki Ranges; valleys of the upper Baran, of the Hab and of the Kand rivers; most of the low ground from Bula Khán's Thána to Jungsháhi.	*Lepidocyclina*, a subgenus of *Orbitoides*. (These foraminifera are not restricted to the middle portion of the Nári group, but also occur in the upper (Gáj) and lower divisions).	
Kutte-ka-Kabar; many localities along the higher slopes of the Khirthar Range; northern portion of the Laki Range.	*Nummulites intermedia.*	
Main axis of the Khirthar Range	*Nummulites complanata.*	*Lutetian* (*middle Eocene.*)

Names of groups.	Constitution.	Mode of formation.	Approximate thickness in feet.
5.—*Khirthar* (contd.)	Massive white or pale-coloured nodular limestone; occasionally some shaly intercalations towards the base.	Marine ...	500 to 1000.
	Massive white or pale-coloured nodular limestone. These lower Khirthar beds, in the most recent classifications, have been separated from the remainder of the Khirthar and form the "Laki group." Shaly layers are locally developed towards the base of this Laki group	Marine ...	500 to 800.
4.—*Ranikot*	Brown limestones interstratified with sandstones, shales and clays.	Marine ...	Up to 700.
	Soft sandstones, shales and clays, often richly coloured with brown and red tints. Occasionally some lignite.	Fluviatile ...	1000 to 1200.
3.—*Deccan Trap*	Basalt	Volcanic ...	40 to 90.
2.—*Marine beds* of the Upper Cretaceous.	Olive shales and sandstones sometimes calcareous.	Marine ...	350 to 450.
	Sandstones weathering black and conglomerates.	Marine ...	700.
	Whitish limestones, partly arenaceous...	Marine ...	320.
1.—*Aravalli* ...	Granite	Plutonic ...	Thickness unknown.

FORMATIONS—(*continued.*)

Principal exposures.	Characteristic fossils.	Geological age.
Hills of Sukkur and Rohri; Bhit and Badhra Ranges; northern portion of Laki Range; western slopes of Daphro Range; western slopes of Surjána Range (east of Bula Khán's Thána); Kambu and Kara Ranges; southern termination of Khirthar Range; Bedur and Dambar Ranges between the Hab and upper Bárán valleys. The shaly beds are locally seen in the hills south of Rohri and at the northern extremity of the Laki Range, particularly at Dharan Lak.	*Nummulites aturica*, *N.—laevigata*, *N.—gizehensis*, *N.—murchisoni*, *N.—(Assilina) exponens*, *Assilina spira*. The period to which these strata belong (Middle Lutetian) is the age of maximum developement of the nummulites.	*Lutetian (middle Eocene.)*
The greater portion of the Laki Range; the eastern scarps of the Daphro and Surjána Ranges; the hills along the railway line from Mánjhand to Jungsháhi; the hills south of Hyderábád; the Makli hills near Tatta. The shaly layers are seen at Meting, between Meting and Jerruck south of Hyderábád and near Tatta.	*Nummulites atacica*, *Assilina granulosa.*	
Low ranges east and west of Leilán and east of Band Vera, neighbourhood of Jerruck.	*Nummulites planulata*, *Operculina canalifera*, (only in uppermost beds; the lower beds contain many characteristic fossils which however have not yet been described.)	*Lower Eocene.*
Eastern scarp of Laki Range from Jakhmari to Ranikot; plain of Leilán. There is an abandoned lignite mine at Leilán.	*Dicotyledonous* leaves.	
Some parts of Laki Range	......	......
Scarp of Laki Range from Jakhmari to near Ranikot, also west of Ranikot.	*Cardita Beaumonti.*	*Upper Cretaceous*
Several exposures along the scarp of the Laki Range.		
Bárrah hill in the Laki Range, 10 miles south-west of Amri.	*Hippurites.*	
Nangar Párkar hills	......	*Archæan.*

CHAPTER II.

PRODUCTIONS.

Botany.

Botany. The Flora of Sind belongs to the botanical region defined by Sir Joseph Hooker as "The Indus Plain, including the Panjab, Sind and Rajputána west of the Aravalli Range and Jumna river, Cutch and Guzerat." Of this he says, "Over the whole province a low, chiefly herbaceous, vegetation of plants common to most parts of India, mixed with Oriental, African and European types, is found, with thickets of shrubs and a few trees, the latter most luxuriant along the banks of rivers." Though 112 Orders are included in the Flora of this region, 33 of them are represented by a single genus and 13 by a single species. The dominant Orders are the following ten:—Gramineæ, Leguminosæ, Compositæ, Cyperaceæ, Scrophularinіæ, Labiatæ, Boragineæ, Malvaceæ, Euphorbiaceæ, Convolvulaceæ.

With respect to its outward aspect the vegetation of Sind has certain characteristic features, indicative of a rainless climate, dry atmosphere and sandy soil largely impregnated with salt. The most striking of these is the predominance of plants with small leaves, or none at all, like the leafless caper, milkbush and so called cactus (*Euphorbia nereifolia,*) and the general absence of large leaves, for the banyan tree, though it flourishes now in congenial circumstances, has undoubtedly been introduced, like the *pipal.* Another feature is the prominence and variety of grasses.

As regards distribution it may be said, with an approximation to truth, that anything will grow in the Indus loam; but what does grow depends upon the quantity of water present and two or three subsidiary conditions. Along the banks of the Indus and its backwaters and canals the *bábul,* or *babur,* as they call it in Sind, flourishes exceedingly, with the tamarisk on sandbanks and giant grasses wherever the force of the current does not prevent

them establishing themselves. On plains annually inundated dense forests of *kandi* (*Prosopis spicigera*) and of tamarisk spring up, with great tussocks of *kánh* grass. In the more arid plains and on the sand dunes a bushy growth is found, varying in character with the quantity of salt in the soil. If salt is abundant it will be *Salvadora persica*, the leafless caper, tamarisk and many small, fleshy-leaved plants of the Goosefoot order. In pure sand *ak* (*Calotropis procera*,) will predominate, or *Salvadora oleoides;* but on hard ground the little thorny *ber* (*Zizyphus rotundifolia*), *khor* (*Acacia senegal*), the so called cactus and many hardy grasses. Even the bleak and scorched hills have a vegetation of their own wherever a torrent bed, or hollow valley, detains a little moisture. *Salvadora*, capers, the small *ber* aforesaid, the wild olive (*Olea ferruginea*) and the *lohiro* (*Tecoma undulata*) climb up to near the tops of the Khirthar hills. The wild oleander brightens the watercourses and the Sind palm (*Nannorhops ritchieana*) is very abundant. Lastly there is the vegetation of the creeks and seashore, embracing various species of *Rhizophora, Avicennia, Ceriops* and other genera popularly lumped together as Mangroves. **Botany.**

A list (probably far from complete) of the indigenous plants and those which, though introduced, have fairly established themselves in a wild condition, is printed as an Appendix. The following have an economic interest.

Bábul, Sindhi *Babur* (*Acacia arabica*). The wood is more used than any other for building and carpentry and is also the principal fuel of the country. Till the last year it was burned instead of coal by the North Western Railway, which took 10 million cubic feet per annum from the Sind Forests. TIMBERS.

Siras (*Albizzia lebbek*). Has a fine, dark heart-wood.

Kandi (*Prosopis spicigera*). Next in importance to Babul as a fuel.

Vilayati Kikar, Sindhi *Bavar* (*Acacia farnesiana*).

Sissu, Sindhi *Tàli* (*Dalbergia Sissoo*). One of the best known and most highly valued timbers in India. It grows abundantly in the Khairpur State.

Botany.

White Poplar, Sindhi *Bahan* (*Populus euphratica*). Much used for turning and lacquer ware. Abounds in Upper Sind.

Wild Olive, Sindhi *Khau* (*Olea ferruginea*). Found on the Khirthar hills. The wood is very heavy, ranging from 65 to 82 pounds per square foot. It is also hard and takes a fine polish. It is used for making combs and for many other purposes. Dr. J. E. Stocks thought it might be useful for wood-engraving and making mathematical instruments.

Lohíro (*Tecoma undulata*). Also found on the hills. A heavy, tough and durable wood, which works and polishes well. It is prized for furniture, carved work and agricultural implements.

Gedúri } (*Cordia myxa*). } Tough woods, much used.
Lesúri }
Liár (*Cordia rothii*). }

Kámo, Mangrove (*Rhizophora mucronata*). The wood is good, but little used except for burning, for which it is excellent.

Timar (*Avicennia officinalis*). } These are also
Chauri, or *Kirari*, (*Ceriops candolleana*) }
Mangroves and are much used in boat-building.

Lai and *Jhao* (*Tamarix indica* and *dioica*). Both good fuels. They supplied most of the fuel used on the old river steamers.

Asri, or *Asreli*, (*T. articulata*). A larger species of tamarisk which grows on hills and hard ground. The wood is used for making ploughs, Persian wheels, &c.

Kirar (*Capparis aphylla*). When this grows large enough the wood is serviceable for building and carpentry.

Tamarind, Sindhi *Amri*, (*Tamarindus indica*). The wood is much used.

Ber (*Zizyphus jujuba*).

Nim (*Azadirachta indica*). Used for rafters and beams.

For more information the article on Forests may be consulted.

FIBRES AND MATERIALS FOR MATS AND BASKETS.

Pan, Elephant Grass, (*Typha elephantina*). This grows abundantly on the banks of the mouths of the Indus, where it is very useful in preventing erosion. The weaving of mats (*pakhás*)

and baskets from its leaves is by no means an inconsiderable industry. From the pollen a sweetmeat named *Búrani* is made, which is much eaten by natives. **Botany.**

Sar (Phragmitis karka). From the reeds of this very common grass baskets and chairs are made, and its flower stems yield a fibre from which soft ropes are made, such as those used on the Indus in tracking.

Khip (Leptadenia spartium). This is a common, twiggy, almost leafless shrub, from which ropes are made, especially for Persian wheels and water buckets, as moisture does not rot it.

Dranu (Crotalaria burhia). Makes good twine and small rope.

Ak (Calotropis procera and *gigantea).* Cordage and nets are much made from the fibres of this very common plant.

Bombay Hemp, *San* or *Sini (Crotalaria juncea),* is cultivated to a small extent.

Farah (Nannorhops ritchieana). This is the wild palm of the Sind hills, the leaves of which (known as *Pis*) are very extensively used for making matting and also for ropes, string, sandals and baskets.

Cotton, Sindhi *Kapáh,* may be mentioned here. *Gossypium stocksii,* which is supposed by Sir J. Hooker to be the wild original of all the varities of cotton cultivated in India, grows on the limestone hills of Sind freely, but does not appear to be turned to any account. Cultivated cotton is treated in the chapter on Agriculture.

DYEING AND TANNING MATERIALS.

The bark of the Babul and of *Ceriops candolleana (Chauri)* and *Rhizophora mucronata (Kinro)* are much used in tanning hides. *Khaero, i. e.,* chips of *Acacia senegal,* which grows on the hills and on hard ground abundantly, is used for tanning and calico printing. The galls of Tamarisk (*Sákun or Sákur*) are also used in dyeing calico. The dye obtained from Babul bark is too well known to need description and is very much used. The Nim tree yields a red dye and there are others of less consequence. The most important dye cultivated in Sind is Indigo (Nír), the *Indicum* of Pliny, which used to be imported from Barbarike on the Indus to Egypt, as stated in the Periplus. It was up to the time of the

Botany. British occupation one of the chief exports of Sind, but its cultivation is now largely confined to the Khairpur State. In British Sind only 5,621 acres were under Indigo in 1904-05. Its decline has probably been due to crude methods of preparation, which Dr. Stocks observed nearly 60 years ago would "never produce a good article." It may be also that inferior species of Indigofera were cultivated: at least 8 species occur wild in Sind.

GUMS. "Googul," the "East India Myrrh" of commerce, is obtained from *Commiphora,* or *Balsamodendron, mukul,* which is indigenous on the hills of Sind. It is known locally as *Gugur.* The Babul and at least one other Acacia, *A. senegal,* yield gum Arabic, which, if not the genuine article, is universally employed as a substitute for it.

DRUGS. It is impossible to attempt a list of these. Scarcely a plant grows of which some part is not used to cure, or alleviate, the ills that Sind flesh is heir to.

PLANTS YIELDING SODA. Sind is rich in plants of the Sueda and Salsola tribe (known generally as *Láni*) from the ashes of which the crude carbonate of soda sold as *Saji khár* is prepared.

OIL SEEDS. The Oil Seeds of the Province, in order of importance, are *Jambho* (*Eruca sativa*), Sesame, or Gingelly Seed, *Tir* (*Sesamum indicum*), Rape, *Sareh* (*Brassica napus*), Mustard, *Sarsu* (*Sinapis nigra*) and Castor, *Heran* (*Ricinus communis*). The first was, and still is so far as it has not given place to kerosine, the oil commonly used in domestic lamps: it is also considered one of the best for anointing the body. In 1904-05 there were 147,111 acres of land under this crop. Sesame and rape (though the oils of both are used in native cookery) are cultivated mainly for export to Europe, where the former is said to be used for the manufacture of "pure olive oil" and the latter for various purposes. In 1904-05 there were 79,774 acres under Sesame and 57,045 under Rape. Mustard oil is used in cookery and medicine and for anointing the body. The quantity cultivated is comparatively, and that of Castor absolutely, insignificant.

The following are the grains, fruits and vegetables cultivated in Sind for human food. All matters relating to the cultivation of them are treated of in the Chapter on Agriculture.

Rice, *Sáriún (Oryza sativa)*. In 1904-05 there were 942,024 acres under this crop. There are many varieties of rice under two chief heads, the red (*Lári*) cultivated in the Delta and Lower Sind; and the white (*Sugdási*) cultivated in Upper Sind. A good deal of rice is exported to Cutch and Káthiawár, but most is consumed in the province. **Botany.** CEREALS.

Bajree, *Bájhri (Penicillaria typhoideum)*. This forms a large proportion of the food of the common people: 809,446 acres were under it, chiefly in Lower Sind.

Jowaree, *Juari* (*Andropogon sorghum*). Next in importance to the last as food: 478,523 acres were under it. Of this and the last there are many varieties in India and other countries and the botanical synonymy of them has become quite inextricable.

Wheat, *Kank* (*Triticum vulgare*). The acreage under cultivation was 491,429, and contemplated extensions of the canal system will probably result in a great increase, for, though much eaten by the upper classes in Sind, wheat is grown principally for export to Europe. The exports of Sind wheat during the 4 years ending 1904-05 were as follow:—

	Cwts.
1901-02	657,710
1902-03	1,405,669
1903-04	704,356
1904-05	3,909,532
Total ...	6,677,267
Yearly average ...	1,669,316

Barley, *Jav* (*Hordeum vulgare*). Only 13,594 acres were under this and much of it was intended for fodder.

The following are cultivated locally to an insignificant extent:— Maize, *Makái* (*Zea mays*), Italian Millet, *Kiringh*, (*Setaria italica*), Common Millet, *Chíno* or *Sáon* (a variety of the same), and *Nachni* or *Ragi*, called in Sind *Nanguli*, (*Eleusine corocana*).

PULSES.

Chickling Vetch, *Matar* (*Lathyrus sativus*). Continued consumption of this pea is said to induce incurable paralysis of the lower limbs; yet it is more grown in Sind than any other, 231,973 acres having been under it in 1904-05. Curry biscuits

Botany.

(*pápar*) are chiefly made of it and the consumption of these in Sind is very large.

Gram, *Chano* (*Cicer arietinum*). Much used in the form of *dál* and in confectionary, and also for the food of horses; 92,543 acres were under it.

Green Gram, *Mung* (*Phaseolus radiatus**), Black Gram, *Mánh* (*P. mungo*), Kidney Bean, *Mohar* (*P. aconitifolius*) and Pigeon Pea, *Túr* (*Cajanus indicus*) are all used as *dál*. The Field Vetch, *Guár* (*Cyamopsis psoralioides*) is chiefly used as a vegetable and the Small-fruited Dolichos, *Chaunro* (*Vigna catjang*) in confectionary.

The following fruits are cultivated in gardens:—

Apple (*Súf*), Peach (*Bádám*), Grape (*Dákh*), Orange (*Nárangi*), Lime (*Límo*), Pomelo (*Papnas*), Citron (*Turanj*), Fig (*Anjír*), Mango (*Amb*), Guava (*Zaitún*), Plantain (*Kevro*), Pomegranate (*Dárhun*), Mulberry (*Tút*), Custard Apple (*Síta-Phal*), Papai (*Papio*), Cocoanut (*Nárel*), Date (*Kharik*); also the following less known to Europeans; *Zizyphus jujuba* (*Súfi Ber*), *Eugenia jambolana* (*Jamu*), commonly known as the Jambool, or Black Plum, *Grewia asiatica* (*Phalso, Phárúhán*) and *Phyllanthus emblica* (*Auro*), which is pickled.

FRUITS.

The apples are of a peculiar, very small variety, excellent for cooking. Hyderábád is famous for them, but they and peaches fail on the coast. Grapes of many varieties and excellent quality grow at Karáchi as well as inland. The best Bombay mangoes do not appear to have been succesfully introduced, but inferior sorts are extensively cultivated and there is a peculiar, long, Sind mango. Sind plantains are very poor, but Bombay plantains, not the best, are grown in Karáchi and large quantities are imported. The date palm grows everywhere, but it is only in Upper Sind, and especially at Sukkur, that the fruit is of good quality. Mulberries are of two kinds, the black, or garden variety, the fruit of which is sold in the Karáchi bazár as "ishtrawberry" and affords the best substitute for that unobtainable luxury; and the white mulberry, which grows all over Baluchistán and Upper Sind and attains a height of 30 or 40

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* NOTE.—The names of this and the next were transposed in all botanical books and manuals until Dr. Prain recently pointed out the error.

feet. The long, thin, greenish fruit of the latter is dried and sold in all the bazárs. It was held in great esteem by Baluchi warriors, who carried it in their pouches and swallowed a mouthful when entering into action to give them stomach for the fight.

A number of wild fruits are much eaten, ripe or in pickle, by the people, *e. g.*, *Cordia myxa (Gedúro* and *lesúro)* and *rothii* (*Liár)*, *Zizyphus rotundifolia (Ber)*, *Salvadora oleoides*, *etc.* The two species of *Lotus*, or so-called Waterlily, *Nymphaea lotus* (Var. *pubescens)* and *Nelumbium speciosum*, deserve special mention. They grow in *dhands* everywhere and yield a considerable revenue to Government in the Manchhar Lake. The roots of both (Sindhi *Lorh* and *Beeh)* are used as food in many forms and their seeds, or nuts, (*Nápo* and *Pábúro*), are much eaten and sold in all bazárs.

The Melon *(Gidro*, but commonly known as *Kharbuza)* and the water Melon (*Hindáno*, or *Chhánho*, commonly known as *Tarbuza*) are much cultivated where sand with an undercurrent of water can be found, as in river beds. Jacobábád is famous for the former and Garhi Yásin for the latter. These are fruits: other gourds are much esteemed as vegetables, *e. g.*, the Cucumber *(Kakri)*, *Luffa acutangula* and *ægyptiaca* (*Túri*), *Momordica charantia (Karelo)*, *Cucurbita pepo (Kadu)*, the Pumpkin, *Citrullus vulgaris (Meho*, or *Dil-pasand)*, of which the Water Melon is an artificial variety, and many others. GOURDS.

The common European vegatables, Cabbages, Cauliflowers, Turnips, Green Peas, French Beans, Tomatoes, Beetroot, Celery, *etc.*, are very successfully grown at Karáchi, Hyderábád and in short, wherever there is a demand for them. Others, which are used by natives as well as Europeans, are more widely cultivated, such as the Onion (*Basar)*, Garlic *(Thúm)*, Radish *(Múri)*, Carrot (*Pitái Gajar)*, Sweet Potatoe (*Làhori gajar*), Spinach (*Pálak*), Brinjal, or Egg Plant (*Wángan*), Bhendie *(Bhíndi*) and Potatoe, which is rapidly gaining ground among the upper classes in India and is much cultivated in the vicinity of Karáchi. The following "country" vegetables are not so well known to Europeans:— *Maríro* (*Amarantus gangeticus)*, *Lúnak* Purslain, (*Portulaca oleracea* and *tuberosa)*, *Methi (Trigonella fœnum-græcum*) and *Singiun* (the pods of the Horse-radish tree, *Moringa pterygosperma*). VEGETABLES.

Botany.

SPICES.

The principal Spices or Condiments produced in the Province are Chillies, *Gárho Mirch (Capsicum frutescens* or *minimum)*, Coriander, *Dhána (Coriandrum sativum)*, Fennel, *Saunf (Fœniculum vulgare)* and Mustard, *Ahur (Brassica nigra)*.

FODDERS.

A large part of Sind consists of pastoral rather than agricultural country, abounding in trees and shrubs grateful to cattle, especially to camels and goats. Among these may be mentioned *Babul*, *Ber* and *Khabar (Salvadora persica)*, which grows best on *kalar* soil, together with various ground plants of the Goosefoot order known by the Sindhis as *Láni*, which are greedily devoured by camels. The foliage of *Timar (Avicennia tomentosa)* provides unlimited provender for the same animals in the Delta. Fodder grasses are numerous: the best known are *Chhabar (Eleusine flagellifera* and *ægyptiaca) Hariali or Chibhar (Cynodon dactylon)* and *Karash (Paspalum sanguinale)*. Indian Corn and Barley are often cultivated for green fodder and the straw of Rice, Bajri and Juari are much used for feeding cattle and horses. Near large towns Lucerne and Guinea Grass are cultivated.

MISCELLANEOUS.

Opium, *Aphim (Papaver somniferum)*, is grown in the Khairpur State. The cultivation of it is prohibited in British territory.

Tobacco, *Tamák (Nicotiana tabacum)*, is grown for local consumption: 8,427 acres were under it in 1904-05.

Hemp, *Bhang (Cannabis sativa)* is cultivated under license in the Lárkána District, but for the drug only, not for the fibre.

Sugar-cane, *Kamand (Saccharum officinarum)*, grows well in Sind and was once more extensively cultivated than it is now.

LAC.

It is open to question whether lac ought not to be classed as an animal product, being secreted by an insect, but as it is an item of Forest Produce, it may be mentioned here. The lac insect, *Carteria lacca*, is a small, gregarious member of the lowly organised family Coccidae, which lives, like Green Fly, Thrip, Cuckoo-spit and other garden pests, upon the juices of plants; and Lac is a hard, cellular, reddish substance which the female secretes as a protection to herself and her eggs. When she dies her body is full of a red substance which forms the "Lac Dye" of commerce. This is intended for the first nourishment of her young, which, having consumed it, break through the crust of

Lac which envelopes them and settle on the nearest tender shoots and begin secreting on their own account. They are at this time very minute, about $\frac{1}{40}$th of an inch in length, and so numerous that they look like a red powder dusted thick on the tender twigs. The young issue in July and again in January; accordingly there are two seasons for gathering the Lac, just before they have spoiled it and consumed the Lac Dye. The insect feeds in this Province on the *Babul, Kandi, Ber, Siras*, Banyan and Tamarisk, but Lac is collected mostly from the first. For some reason not yet discovered it flourishes only in very limited areas, being absent from regions which seem equally suitable, or occurring too sporadically to repay collection. The great source of supply is the Babul forests on the Indus and the Fuleli Canal within a radius of 20 or 25 miles from Hyderábád. It is also found along the canals in the Eastern Nára Irrigation Division, in some other parts of the Thar and Párkar District and in the Kotri Taluka of the Karáchi District. **Botany.**

Lac is collected by lopping off the incrusted twigs. These, cut into short lengths, are known in the trade as "Stick Lac." After scraping the crust off and carefully washing out and preserving the dye, the Lac is melted into the thin leaves known as "Shell Lac." Both these forms enter largely into the returns of export trade from Bengal; but Sind Lac, which is inferior, is mostly used in the Province or in the Punjáb, by lacquer workers. In its crude state, as scraped from the twigs, it sells in Hyderábád at from 12 to 22 rupees a maund. The dye does not appear to be preserved in Sind. The Lac is long and patiently winnowed and sifted to separate bark and dirt, then pulverised with a grinding stone and again sifted, after which it is put into tubs with water and trodden and washed until all dirt and colouring matter (the precious dye) have been worked out of it. It is then ready for use.

The revenue derived by the Forest Department from the sale of the right to collect Lac during the last 5 years is shown below. The amount has always been very variable, but the extraordinary increase in the last two years must be attributed to more careful realisation of the revenue. These figures do not include amounts collected by the Revenue and Public Works Departments, which

Botany.

sell the right to collect Lac and Babul Pods together :—

1901-02...	...	Rs. 1,345
1902-03...	...	„ 2,796
1903-04...	...	„ 12,536
1904-05...	...	„ 21,324
1905-06...	...	„ 37,108

Forests.

Table XIV.

Forests. HISTORY.

The forests of Sind occupy an area of 6,000,000 acres, and, divided into separate blocks, follow the course of the River Indus in all its windings from the Punjáb boundary in the north to the sea in the south: they in no place depart far from that course except in the north, where the flat country, as far west as Jacobábád and nearly as far east on the other side, had formerly offered facilities for the waters of the annual inundations to spread. The greater number of the forests are thus strictly riverain, the remainder being inland, situated in the northern Districts of Sukkur and the Upper Sind Frontier. A small area to the south of Hyderábád town, and a larger extent of country on the Eastern Nára in the Thar and Párkar District, form detached groups or patches. Some of the riverain blocks have latterly been converted into inland forests owing to the construction of canals and bands by the Irrigation Department for the purpose of cultivation and protection from disastrous floods.

Prior to the British conquest the annual inundations were unchecked in their flow practically throughout the Province, cultivation was not half of what it is now, the population was probably not a third of that existing at the present day, and forest growth covered all the land where the water reached; the people cut down the timber and made temporary settlements and tilled the soil wherever they chose, and were thus responsible for the separation of the wooded area into the patches and blocks which characterise the country today. Certain riverain forests were reserved by the Mírs for purposes of the chase, were walled in with mud walls, existing in many cases to the present time, and strictly protected from interference and trespass on the part of the people by severe game laws. The tree growth was carefully fostered, traces of

canals and dykes testifying even now to the thorough manner in which this was done. Forests.

After 1843 these game preserves, or "Shikargahs" as they were called, became the nucleus of the present Forests of Sind. There is nothing to show when they were first demarcated as Forest, but in the year 1847 Major Scott was appointed the first Forest Ranger in Sind. He was followed by Captain Crawford, Dr. Stocks the botanist, Captain Hamilton, and Mr. Dalzell, another celebrated botanist. These last two Rangers demarcated all the *shikárgáhs* by erecting boundary marks. We know from the records that in 1861 Mr. Fenner was put in charge of the forests, with a staff consisting of one Assistant Forest Ranger and two Inspectors; and there are reports to show that a certain revenue was realized from them from that period annually. In 1871 Dr. Schlich took charge and became the first Conservator of Forests. He organised the Department and divided the Sind Circle into three Divisions corresponding to the Revenue Divisions, placed each in charge of a District Forest Officer under him, with 15 Tapedars and one to three Sub-Rangers in each Tapa, or Range, besides a number of Beat Guards with an average charge of 3500 acres each. Mr. Campbell, following Dr. Schlich, obtained the sanction of Government in 1876 to the reconstitution of the Circle into the four Divisions of Sukkur, Naushahro, Hyderábád and Jerruck with 15 Ranges, amounting in all to an area of 527 square miles or 343,325 acres. These Divisions were no longer conterminous with the Revenue Districts, but extended over both banks of the Indus and have remained unaltered up to the present day. During Colonel MacRae's tenure of the Conservatorship a fifth Division was created in 1888, but was shortly abolished: it was called the Jacobábád Division. By this year the forest area had grown to 975 square miles. The subordinate establishment was twice reorganised, once in 1875 and once in 1885. It is probable that a third reorganization scheme, proposed as far back as 1890, will be brought into force shortly.

In this present year (1906) the Sind Forest Department consists of a Deputy Conservator of Forests in charge, responsible to the Commissioner in Sind, and 5 members of the Controlling Staff, of whom four are in charge of Divisions, while one is doing work as Superintendent of Forest Contour Surveys. Of these one Officer ADMINISTRATION.

Forests. only belongs to the Imperial Forest Service: the rest are Extra Assistant Conservators of the Provincial Branch. There are 5 Rangers and 19 Foresters in charge of Ranges, of whom the great majority are untrained men, only 4 of the Rangers and 5 of the Foresters having passed through the Forest Schools in Poona or Dehra Dun. There are 352 Forest Guards in charge of Sub-Ranges and Beats and Depôts; some few do orderly work to Range Forest Officers as well as their office work, for there are no offices attached to Ranges in Sind.

The clerical establishments sanctioned for the Circle and Divisional Offices consists of 6 Surveyors and 24 Clerks, 6 for the Circle, 5 for Sukkur and 4 for each of the other three Divisions and 1 for the Forest Contour Survey Office.

Under the late proposals for reorganization, sanctioned by the Government of India, there will be 5 Rangers, 60 Foresters and Sub-Rangers and 359 Guards in the executive branch; 48 clerks for the Controlling Offices, Range Offices and Depôts (the necessity for Range Offices having been recognised, as well as the advisibility of bringing the Depôt establishments on to the clerical list); and 5 surveyors.

WORKING PLANS.

There is no record of management prior to the year 1860. From that date Administration reports are available to show that a certain revenue was realised from the sale of wood fuel to the Indus Flotilla Company. It does not appear that any attention was paid to conservation or protection between 1860 and 1870, although some lands were added to the Government Forests and efforts were made to foster a trade in the produce. Revenue seems however to have been the only object in view. The earliest scheme of systematic working was proposed by Mr. Campbell in the year 1875 and provided for exploitation on the area plan with a revolution of 15 years, and provision for reservation of standards for timber as well as regulations for grazing of cattle. The reason for this introduction of systematic working was that, about that time, the Indus Flotilla Company was supplanted by the North Western Railway, which required a very large amount of wood fuel, which it was not certain the forests could produce for ever. In 1891 Mr. Hexton introduced some slight change in the working system; but neither

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his plan of working nor the former one seems to have been productive of any sylvicultural advantage to the forests. Little attention was really paid to the prescriptions of the plans, and the forests suffered accordingly. It was not until the year 1896 that anything really useful was done towards the preservation and systematic working of the area. Then Mr. Dasai obtained the sanction of Government for the preparation of Working Plans under the provisions of the Forest Code. The work was immediately started in the field and last year saw the submission of the last of the Working Plan Reports, namely that for Sukkur Division. The three others for Hyderábád, Jerruck and Naushahro were brought into force in 1901, 1902, 1903, respectively. These Plans are all based on the area system with a revolution of 30 years for the chief species, less for others. As the chief demand for wood was fuel, no place was given in the prescriptions of the Plans to the production of large trees; the Railway required nothing but firewood. But circumstances are now different as the Railway has substituted coal for wood and a demand has arisen from the Gun Carriage Factory for timber, besides which there has always been a fairly good local market for the same, which is expanding as the years go by. It may soon be found advisable, therefore, to make provision for the production of babul timber of large size. The Working Circle is the unit of management and its area has been fixed so as to allow of one coupé, or cutting of manageable dimensions, to be exploited each year of the revolution prescribed; each such unit forms a beat in charge of a Guard. Coupés are prescribed for some years in advance, variable in number, and such number of years is called a period.

There are certain difficulties connected with the systematic carrying out of working plan prescriptions in Sind which are unavoidable owing to the annual liability of the riverain forests to erosion, and to the wholesale changes which now and then take place in the river's course. It so happens at times that several year's coupés are washed away during an inundation before their turn for exploitation comes round; occasionally even a whole forest disappears. While it is true that erosions of area are more or less counterbalanced by corresponding accretions, these constant changes are inimical to system; and it is therefore impossible to

Forests. forecast accurately the sequence of working or the outturn of the forests for any length of time.

The exploitation of forest material is carried out by contract agency, the year's coupés being sold by public auction on departmental estimate of out-turn in fuel. The contractors supply the local wants of the towns and factories and mills in timber, fuel and charcoal; and export a small portion thereof to sea ports down the coast, to the Persian Gulf and to Quetta in Baluchistán. The chief lines of transport are the river, its backwaters and arms and canals, which are connected with the forests by very indifferent roads and temporary tracks made by the contractors. The vehicles used are camels and donkeys by land, boats by water; rafting is never practised and bullock carts are only used occasionally in Sukkur Division. The cutting work is done by Chavans, Brahuis and Kachhis.

PRODUCTS. The forest growth consists of four chief sorts of trees, namely *Acacia arabica* or *babul*; *Prosopis spicigera* or *kandi*; *Populus euphratica* or *bahan*; and two species of tamarisk, *Tamarix gallica* and *dioica*, called *lai* and *jhao* respectively. Of these *babul* is the most useful and occurs chiefly in the two southern Divisions of Hyderábád and Jerruck, although it is met with also fairly plentifully in Naushahro and Sukkur. It yields an excellent timber used extensively for wheels, agricultural implements, building purposes and fuel; a gum which is only slightly inferior to true gum-arabic; an astringent bark which is used for dyeing and tanning; and pods affording an excellent food for cattle of all kinds. It grows when young in dense, unmixed crops, forming a covering to the ground through which very little sunlight can penetrate, but becomes thinner naturally as it reaches maturity. It comes up readily from seed and is best regenerated by artificial sowings and has a maximum height of 60′ to 80′, with a girth when full grown of from 9′ to 12′ at breast height in favourable circumstances. *Kandi* is next in importance, is characteristic of the lands furthest removed from the river, and is the chief tree of the Sukkur Division; it yields a good fuel, but is of little use for building or other purposes; the pods are used as fodder for cattle, goats and camels in the same way as those of babul. *Bahan* is most plentiful in Sukkur Division also, growing within the immediate influence of the inundations, and yields wood fer

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building and lacquer-work. Tamarisk exists chiefly in the new lands thrown up by the Indus and is equally distributed throughout the Province, giving a good fuel and wood for agricultural implements and turnery. Tamarisk and *bahan* both come up thickly in the *kacha* lands, from naturally sown seed washed down by the river, more resembling cereal crops in density than anything else in the first year. The former suffers little as it grows from natural thinning; the latter becomes fairly open in mid-life and quite open as it nears its term of existence. Tamarisk hardly ever reaches a large size; *bahan*, on the other hand, becomes a tree of good diameter and respectable height. *Kandi* is, when cut, immediately attacked by insects and does not last. Tamarisk is liable to attacks of the same sort even when green, and it is difficult to find a sound tree of the species in the forests. The forests of Sind might be said to be divided into three bands according to their distance from the river; the first the *Bahan*-tamarisk band, the second bearing *babul*, the third characterised by *kandi* growing always in very open order, frequenting the heighest and driest parts and occupying, on the whole, the largest area of the three.

Another tree occurring occasionally in the forests is *Dalbergia sissoo* or "táli," but it is not indigenous to Sind. It is found near villages and wells in the revenue lands, especially in Sukkur, and has presumably been planted there by the people because of its valuable timber. It is especially plentiful in the Khairpur State. The Forest Department established a few small plantations 20 or 30 years back in Sukkur, which have in several cases flourished, notwithstanding subsequent neglect, and now contain large trees which are said to be worth Rs. 20 and Rs. 30 each. During the last four years the area of plantation has been extended and very promising results have been obtained so far. The timber is very durable and commands a high price in the market and is known as "rose-wood."

Acacia senegal, or *khor*, yields the true gum-arabic and is found on the edge of the most western forests in Hyderábád Division and in the small valleys and nalás of the hill ranges of Sind, as also all around Malir in the Karáchi District. No notice seems to have been taken of the existence of the tree hitherto, except in a botanical way,

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Other trees met within forest limits, including useful bushes, are:—

Zizyphus jujuba or *ber*, yielding fodder for goats and camels.
Azadirachta indica or *nim*, yielding timber.
Albizzia lebbek or *siras*.
Ficus bengalensis, banyan or *wad*, and *F. religiosa, pipal.*
Tamarindus indica, tamarind.
Acacia Farnesiana, Vilayati Babul.
Cordia Myxa, lesúri, and *C. Rothii, liár.*
Parkinsonia aculeata, vilayati kikar.
Casuarina equisetifolia, planted only.
Thespesia populnea, bhendi; near villages and scarce.
Capparis aphylla, kirir.
Salvadora persica, khabar, the mustard-tree of Scripture.

The last two are bushes, but grow large enough to supply small rafters for building purposes; the former yields fruit and shoots which have a marketable value for table purposes; the fruits of the latter are eaten in years of scarcity. Both these bushes are characteristic of dry or waterless lands, the latter more specially of "kalar" or salt lands, where it abounds.

Lac is one of the secondary products of the forests, and is chiefly found on babul trees, but is not in any way cultivated, notwithstanding that it is valuable and could easily be increased by artificial means. It has already been described. Reeds from *Sar* and *kánh* grasses (*Saccharum spontaneum and arundinaceum*) for blinds, shades and the walls of temporary huts; and *sar* grass (*Phragmitis karka?*) for baskets, chairs, and ropes are other products. Other grasses, *dub, hariali, chhabar,* of the genera *Eragrostis, Eleusine* and *Cynodon,* and others of *Andropogon, Paspalum,* &c., yield excellent fodder for animals. Fishery contracts in the forest *dhands* also give a small profit. The grazing of animals on permit is productive of a large revenue, and resident "*Maldars*" or graziers occupy more or less permanent "*bhans*" (settlements) in every forest where there is anything to feed their cows, buffaloes, goats, and camels. Most of these "*Maldars*" are originally hill men. In years when the rain fails in the hills many beasts are brought down to the inundated country to tide over the interval of scarcity, and at such times

herds of goats, sheep and cows may be seen constantly on the move between the mountains and the valley of the Indus. **Forests.**

CAUSES OF INJURY.

The chief causes of damage to forests are lopping and fires, the graziers being responsible for most of it. Continuous attention is paid to the suppression of both these nuisances but it is difficult to make any impression on them, for fires bring up early grass and lopping of branches is one of the easiest ways of feeding animals. The river, as has been mentioned above, erodes considerable portions of tree-bearing land in some years, and causes losses which it is not always possible to prevent by the system in force of cutting strips along the banks. Amongst the minor causes of damage may be mentioned beetles of the family of *Cerambycidæ,* whose larvae riddle green tamarisk trees and even attack hard babul wood: moth larvae, belonging to the family of *Cossidæ,* attack chiefly the tamarisk and in the same manner as the beetles. Buprestid and scolytid beetles make short work of *kandi,* tamarisk and *bahan* wood once it is dying or dead, and locusts destroy the pod crops over large areas in certain years. Finally severe frosts render whole years of sowing useless by killing all the young seedlings in the coupés under regeneration; and sometimes, as in the winter of 1904-05, have a similar effect even upon well grown trees of all species.

REVENUE AND EXPENDITURE

The annual outturn in timber and fuel under the present system of management has been 2·20 and 170 lakhs of cubic feet respectively; 100 lakhs were supplied to the Railway and the local demand swallowed the balance. The total value of this wood amounts to 1·54 lakhs of rupees. These figures are for the year 1903-04.

Below is given the revenue and expenditure for the years 1855 to 1905-06, by quinquennial averages up to 1895 and annually after that :—

Year.	Revenue.	Expenditure.	Surplus.	
1860-61	62,734	41,720	21,014	Averages.
1865-66	1,66,617	48,503	1,18,114	
1870-71	2,41,635	1,54,636	86,999	
1875-76	2,62,008	1,74,824	87,184	
1880-81	3,78,550	2,71,831	1,06,719	
1885-86	4,98,286	3,64,964	1,33,322	
1890-91	6,08,321	4,18,520	1,89,801	
1895-96	4,65,775	2,34,807	2,30,968	

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Year.	Revenue.	Expenditure.	Surplus.
1896-97	3,12,297	1,34,209	1,78,088
1897-98	2,67,114	1,39,611	1,27,303
1898-99	2,90,207	1,49,779	1,40,428
1899-1900	3,09,488	1,45,319	1,64,169
1900-01	2,68,089	1,44,105	1,23,984
1901-02	3,34,738	1,63,892	1,70,846
1902-03	2,61,650	1,41,138	1,20,512
1903-04	3,21,145	1,28,296	1,92,849
1904-05	4,06,954	1,41,106	2,65,848
1905-06	3,87,000	1,58,200	2,28,800

Wood is responsible for 63 per cent., grazing for 25 per cent., and Minor Produce for 12 per cent., of which last babul-pods and lac are answerable for nearly the whole amount, equally divided.

The Forest Settlement of Sind was finished in the year 1895. A few areas are being added year by year as occasions for extension offer, and their settlement is effected in due course. Demarcation by boundary marks has been nearly finished throughout the Province; these marks consisting of earthen mounds with central wooden stakes placed at stated intervals along cut lines of 30′ in width, both on outside boundaries as well as on the internal boundaries of Compartments of a square mile each, into which every forest is divided for purposes of easy management.

Wild Beasts.

Wild Beasts.

For some reason or other the mammalia of Sind have not had the same attention from naturalists as the birds, and the following rough list must be considered provisional.

Carnivora. The Tiger *(Felis tigris,* Sindhi *Wágh)* is now extinct in Sind. The last survivor, a female, was shot in 1886 by Colonel McRae, Conservator of Forests. In 1878, Mr. H. C. Mules shot a very large tiger, and a tigress and cub were killed by other members of the same party, while marks of several more were seen. They haunted the dense grass jungles of the Rohri Division, extending their range sometimes to the Upper Sind Frontier and Sukkur Districts. Their extinction was due to the extensive destruction of these jungles by the river and artificial clearance, coupled with persecution by the white man. The Panther *(F. pardus,* Sindhi *Chíto)* probably ranged widely over Sind at one time. A leopard

Wild Beasts.

and a lynx are mentioned by Lieutenant Carless among the animals met with in the dense jungles of the Delta in 1837. They are confined now to the high hills of the Khirthar Range, where several have been shot by European officers. Rewards have been paid from Government treasuries for the destruction of 19 in the last 10 years. They are noticeably lighter in colour and have much longer fur than Indian panthers generally. The Fishing Cat *(F. viverrina)*, sometimes called "Tiger Cat," occurs on the Eastern Nára (Mr. M. D. Mackenzie shot one in 1906) and probably on the banks of the Indus and the sea coast. The Desert Cat *(F. ornata)* is not uncommon about Karáchi and has been caught killing turkeys in the Cantonment, but there is no information about it from other districts. The Jungle Cat *(F. chaus)* is the common wild cat of all Sind and seems to haunt open scrub jungle by choice. It does much mischief in the zoological gardens at Karáchi. The Indian Lynx (*F. caracal* Sindhi, *Phekári*) is nowhere common, but appears to occur in all districts. Among Shikáris it is known by its Persian name *Siáhgosh*, "Black-ears." The Small Civet Cat (*Viverricula malaccensis*) was not supposed to be found in Sind until a fine specimen was procured expressly for this Gazetteer through Mr. D. G. Ommaney, District Superintendent of Police, Hyderábád. It occurs both in that and the Lárkána District and probably elsewhere and is known as *Khathori* (=*Kashturi*=musk) *Bilo*. It is also called *Jhangrád Bilo*, but that merely means jungle cat and is applied somewhat promiscuously. Two species of Mungoose, (*Herpestes mungo* and *auropunctatus*, Sindhi *Nor*) are found in Sind, but they are not commonly distinguished. The Hyæna *(Hyæna striata*, Sindhi *Charákh)* appears to be found in all parts of the Province. They are said to kill many asses, but in the official returns of "Loss from Wild Animals" they have an insignificant place. The Wolf (*Canis pallipes* Sindhi *Baghar*) on the other hand is credited with the destruction of 2900 Cattle (sheep and goats mostly) per annum. Human beings are seldom attacked by it in Sind. During the last 10 years rewards have been paid for the destruction of 1178, and they are not nearly so common as they were. Blandford says that the European Wolf *(C. lupus)* is found in western Sind; but as it is distinguished by little else than its warmer fur, the case is similar to that of the Sind panther. The Jackal (*C. aureus*, Sindhi *Gidar*) is very common. Of Foxes (Sindhi *Lúkar)* there are two

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species, the common Indian Fox *(Vulpes bengalensis)* and the Desert Fox (*V. leucopus*). Apart from other differences the latter can be distinguished at a glance by the end of its tail being pure white instead of black, yet it has proved difficult to get any information as to their respective distribution. Both are found in the vicinity of Karáchi: the latter probably predominates in the dry and sandy tracts. The Indian Badger (*Mellivora indica,* Sindhi *Gorpat,* and also *Gornár*) occurs in every part of Sind, but is so seldom seen that imagination has license to deal with it and does. Not only is it said to dig up graves and feed on the corpses of the dead, but to enter houses and carry off infants. Intelligent Shikáris will aver that, if it meets a man alone, it will rise on its hind legs, almost suffocate him with its sepulchral breath and hug him to death. The Common Otter *(Lutra vulgaris,* Sindhi *Ludhra)* is abundantly found in the Indus and often kept by the *Muhánas* to assist in driving fish. The Smooth Otter (*L. ellioti*) is said by Blanford to be common in Sind, but it has been so lately discriminated that little is known about it.

The Himalayan Black Bear (*Ursus torquatus*) known by the Baluchis as *Mam,* is found on the heights of the Khirthar Range. One was shot not far from Kute-ji-kabar in 1902 by Mr. W. H. Lucas, Collector of Lárkána, and others have been seen.

Insectivora. Muskrats (*Croeidura crœulea,*) are not nearly so obtrusive as in some parts of India. Hedgehogs (Sindhi *Jaha*) are fairly common and three species are said to be found in the Province, *Erinaceus collaris, jerdoni* and *pictus.*

Chiroptera. The rarity of Flying Foxes (*Pteropus medius,*) in Sind is perhaps attributable to the absence of indigenous species of *Ficus.* They are occasionally seen, however, in the Lárkhána and Upper Sind Frontier Districts. Two smaller species of Fruit Bats, *Xantharpia amplexicaudata* and *Cynopterus marginatus,* are not uncommon locally. Murray says that the latter is a pest to the gardeners at Malir near Karáchi. The Indian Vampire is not common, but Murray records it from Karáchi and also three species of Leaf-nosed Bat. A reliable list of the Vespertilionidae of Sind is still a desideratum: Murray mentions ten species.

Rodentia. The thieving and pestiferous, but undeniably pretty, Palm Squirrel (*Sciurus palmarum,* Sindhi *Noríaro*) is the only member

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of the family recorded from Sind. The commonest rat in Sind is probably the Jerboa Rat (*Gerbillus indicus*), or its cousin the Desert Gerbille (*G. hurrianæ*). Mr. Gleadow of the Forest Department was the discoverer of another species at Rohri, the little Hairy-footed Gerbille (G. *gleadowi*). The common house rat, in Karáchi at any rate, is pure white on the under parts, but brown rats are also found: both are ranked now as varieties of *Mus rattus*. *Mus decumanus* cannot be absent from such a sea port as Karáchi, but the bandicoot is unknown. The Short-tailed Mole Rat (*N. hardwickii*) is widely spread in the Province and is ranked among the enemies of the farmer. It is called *kúo* in Sindhi, like all other rats. The common house mouse of Sind is the Persian species, *Mus bactrianus*. The field mice have not been studied. The Porcupine (*Hystrix leucura*, Sindhi *Serh*) is common and said to be particularly devoted to potato crops in Sind. The little Sind Hare (*Lepus dayanus*, Sindhi *Saho*) is abundant in scrub jungle throughout the Province and appears to be the only species.

Ungulata. As is well known, the Wild Ass (*Equus hemionus*) inhabits the Rann of Cutch and Jesalmir; but there is more likelihood than proof of its crossing our frontier. The smallest of Indian wild sheep, the Oorial (*Ovis vignei*), best known in Sind by its Brahui name *Gad*, is found on the Khirthar Range and the Pab hills down almost to the plains. The finest horns recorded from this part are a pair in the possession of H. H. Mir Muhammad Hasan Ali Khan, C. I. E., which measure 36 inches round the curve.

The Sind Ibex, or Persian Wild Goat (*Capra œgagrus*, Sindhi *Sarah*) is found on the same hills at higher elevations. The numbers of this noble beast are being rapidly thinned, but it finds an asylum in the Khirthar hills of the Karáchi Kohistán, which are reserved for H. H. Mir Muhammad Hasan Ali Khan, C. I. E., and where it is preserved by his men from indiscriminate destruction. His Highness has a unique collection of heads, including one with horns of 52 inches; but the record is believed to be 52¼ inches in length and 7 in circumference at base. This was shot by the late General Marston.

The "Chinkara" (*Gazella bennetti*), miscalled *Haran* by Sindhis, is found throughout Sind in suitable places, *i. e.*, on the *pat* at the foot of hills, on the borders of the *Rann* and, in short, wherever bare desert borders on grazing grounds. It is much

Wild Beasts.

less common than it was, except in the Khairpur State, where it is preserved. His Highness the Mir of Khairpur has a head with horns said to measure 16 inches, which must be the record for all India

The true *Haran*, or Black Buck (*Antilope cervicapra*), is not indigenous to Sind, but was introduced into the Khairpur State by His Highness Mir Sir Ali Murad Khan, G. C. S. I., and has multiplied exceedingly. This herd is characterised by great spread of horns; one pair in possession of His Highness measures 26″ in length and the same in expanse from tip to tip. The Hog-deer (*Cervus porcinus*, Sindhi *Pháro, or Jángho*) is found throughout Sind wherever there is thick jungle, and does much damage to crops. His Highness the Mir of Khairpur has a head with horns of 23½ inches, which must, if they have been correctly measured, be the record for India. The Swamp Deer, or *Barasingha* (*Cervus duvauceli*, Sindhi *Goin*) is extinct like the tiger, with which it shared the jungles of Rohri within the memory of officers now serving in Sind. The wild Pig (*Sus cristatus*, Sindhi *Súar*) is common throughout the Province and is regularly hunted with the spear in Jacobábád; occasionally also in Hyderábád. They grow large: a pair of 10 inch tusks were secured by Mr. H. C. Mules in the Badin Taluka.

Cetacea. The great Indian Fin-whale (*Balænoptera indica*) the largest of all known animals, is probably the species which is frequently seen by sailors on the coast of Sind and Baluchistán. It has more than once come into collision with steamers, and the remains of a skull at the Karáchi Museum, which measured 17 feet 8 inches, are said to belong to an individual stranded on the coast. From the unprecise, but emphatic, statements of Karáchi fishermen it appears that they sometimes harpoon a gigantic "fish" and obtain infinite oil from it. The common Porpoise of the coast (*Steno plumbeus*) visits Karáchi and no doubt goes up all the creeks; but the Porpoise of the Indus (Sindhi *Bulhan*), is *Platanista gangetica*. It is quite blind, a very suitable condition for its circumstances. Its oil is a precious specific for rheumatism and the *Muhánas* burn it in lamps. Some castes eat the flesh. The porpoise is caught with the aid of trained otters, which are turned loose in some pool near the bank of the river where there are fish. The blind porpoise hears the noises that they make and

hurries up, (not to eat the otters, but to share their feast) when a stout, bell-shaped net is clapped on it and it is speared through the meshes. **Wild Beasts.**

Edentata. The Scaly Ant-eater (*Manis pentadactyla,* Sindhi *Chhalá Mirun*) is certainly found, at least in the south of Sind, but is seldom seen on account of its underground habits. One brought to the Karáchi gardens in 1905 was kept successfully for 3 months on a diet of raw eggs beaten up in milk.

NOTE.—Domestic animals are treated in the Chapter on Agriculture.

BIRDS.

Birds. Sind has been fertile in Ornithologists, or lucky in attracting them. In the cold season of 1872 Mr. A. O. Hume made a tour from Jhelum to Maskat and took away 2,500 specimens of birds representing 250 species. A delightful account of this tour was published in Vol. I of "Stray Feathers." The list of our birds was subsequently augmented by Mr. James (afterwards Sir Evan James and Commissioner in Sind), Captain E. A. Butler, and Messrs. W. T. Blanford, S. B. Doig and others, and now numbers about 400, inclusive of oceanic species observed on our coast. As late as 1904 a pretty European or Central Asian Tit, *Aijitheliscus coronatus,* was added to the list by Mr. T. R. Bell. A casual inspection of this list will suffice to show the peculiar character of the avifauna of Sind, resulting from its geographical position and its physical features. The valley fertilised by the Indus is cut off from the rest of India by a desert barrier which sufficiently accounts for the absence or scarcity of many familiar Indian species and some whole families, *e.g.,* Jungle and Spur-fowls, Bush-quails, Bulbuls (except two), Iora and all the Sunbirds and Flower-peckers except one. The absence of others, such as Horn-bills, Fruit-pigeons and Barbets, is explained by the nature of the indigenous vegetation, which is characterised by the general absence of trees with large leaves and therefore of the genus *Ficus.* On the other hand the western boundary of Sind is geographically one with Baluchistán and lies open to species from southern Europe, north-east Africa and Arabia which scarcely spread further east. Finally its jheels and swamps and its position with reference to migration routes combine to make Sind a winter resort of waterfowl without a rival in India. With our present knowledge of distribution

Birds. district lists are impossible, but brief notes on the bird life of the Province as a whole may be useful in every district.

Corvidae.—The Indian Corby (*C. macrorhynchus*) is wanting, the Common Crow (*C. splendens*) too abundant and markedly lighter on the neck than those of southern India. Jacobábád is invaded by hosts of Ravens (*C. corax*) every winter, which spread southwards as far sometimes as Karáchi. The Brown Raven (*C. umbrinus*) comes into Lárkána and the Upper Sind Frontier. The Indian Magpie is common.

Besides these the passerine birds of Sind include the common Indian Grey Tit, 7 Babblers, 2 Bulbuls, one Drongo, 27 Warblers, almost all being winter visitants merely, 7 Shrikes inclusive of the Woodshrike, 3 Minivets, the Cuckoo-shrike *(Graucalus macii)*, 2 Orioles, (*O. kundoo*) and the European Oriole (*O. galbula*) as a rare visitor, 3 Mynas, at least 3 Starlings and the Rosy Pastor, cursed of farmers, 5 Flycatchers, including the Paradise Flycatcher rarely seen, 12 Chats, nearly all winter visitants, and one Redstart, 2 Robins and the Bluethroat, 4 Thrushes, in winter only, 3 Weaver-birds, one Munia and the Amadavat, 7 Sparrows and Finches, 6 Buntings, of which 4 are only seen in winter and one, *Melophus melanicterus*, the Crested Bunting, is rare at any time, 7 Swallows and Martins, but not *P. concolor* so abundant elsewhere, 15 Wagtails and Pipits, of which only 2 are resident, 10 Larks, only one Sunbird and no *Dicœum.*

From the Orders Pici, Zygodactyli, anisodactyli Macrochires, Coccyges and Psittaci we have only 3 Woodpeckers, no Barbets but the Coppersmith and that problematical, 2 Rollers, 4 Bee-eaters, 3 King-fishers, the European Hoopoe, 3 Nightjars, the House Swift, with glimpses of 2 or 3 other species, 5 Cuckoos (if we include *Taccocua leschenaultii,* which has been found on the Hab river) and 2 Parrots.

Of these the following are familar garden birds:—The Common Babbler, or "*Sátbhái*" (*Crateropus canorus*), its small copy, *Argya caudata,* the Sind Bulbul, King Crow, Tailor Bird, Bay-backed Shrike, Common Minivet, Myna, Fantailed Flycatcher (*Rhipidura albifrontata*), Brown Munia, Amadavat (which nests in Karáchi gardens), Sparrow, Purple Sunbird, Roller, Common Bee-eater, White-breasted Kingfisher, Koel, Pied Cuckoo (at the end of the

Birds.

monsoon) House Swift and Roseringed and Alexandrine Parrakeets (the last now named *P. nepalensis* in contempt of Alexander the Great, who took this species back with him from Sind). The cold season brings in a number of Tree Warblers, the common Starling, the Rosy Pastor, or "Juari Bird" (which indeed only leaves us from the end of May to the beginning of July and possibly breeds in Sind.) Redstart, Common Swallow and several grey and yellow Wagtails. We miss the familiar Bombay Bulbul, which, however, is found about the Eastern Nára. Space may be spared for a few notes on less familiar birds. The Striated Babbler (*Argya earlii*) occurs all along the Indus, nesting in long grass. That curious Persian bird, *Hypocolius ampelinus*, has been met with several times in the Karáchi District. Three Warblers, *Acrocephalus stentorius*, *Hypolais rama*, *Laticilla burnesi*, commonly regarded as winter visitants, have been found breeding in the Eastern Nára and elsewhere, and so has the little Starling, *Sturnia minor*. The Chats, which affect chiefly the hilly and desert tracts, include *Saxicola monacha*, which has been found between Sehwán and Kalat. The Desert Finch (*Erythrospiza githaginea*) is another bird which distinguishes Sind in the winter, and the Eastern Linnet (*Acanthis fringillirostris*) is said to have been met with near Karáchi. The Rufous-backed Sparrow (*P. pyrrhonotus*) first discovered by Sir A. Burnes and then lost for forty years, was rediscovered by Mr. Doig breeding in the Eastern Nára. The Desert Lark (*Alæmon desertorum*) appears to occur from Jacobábád to Karáchi, and the Eastern Calandra Lark (*Melanocorypha bimaculata*) visits Upper Sind and the deserts east of Umarkot in winter. *Pyrrhulauda melanauchen* is common in the deserts to the east. Our Skylark is *Galerita cristata*, which sings sweetly but is seldom caged by the Sindhi. The European Bee-eater (*M. apiaster*) has been seen in Sind and *M. persicus* breeds in the Province. The European Night-jar also visits Sind in winter.

The Raptorial birds find good living in Sind with its teeming population of desert rats, hares and lizards, not to speak of waterfowl. Of the three great Horned Owls *Bubo coromandus* makes its croaking voice heard in all watered and wooded parts from Játi northwards: *B. bengalensis* is less common, and *Ketupa*, the Fishing Owl, has only once been procured near the Gáj river,

Birds. The little Owlet is everywhere, *Scops brucii* haunts the old gardens about Karáchi, the Long-eared Owls and Short-eared (*Asio otus* and *accipitrinus*) visit us in winter. The Lammergeyer is often seen on the Khirthar hills and there are 6 other vultures, including *V. monachus*. *G. bengalensis* breeds commonly on the banks of the Indus and there are nests on the large trees about the boat-building yards at Sukkur. The Eagles include the Imperial, Tawny and Spotted, Bonelli's (which is very common on the banks of the Indus) and its younger brother the Booted Eagle. The Serpent Eagle is not rare in open country and the Long-legged Buzzard is one of the commonest birds to be seen on the barren hills in the west. The White-eyed Buzzard and the *Shikra* are common, as is the European Sparrow Hawk in winter. Pallas's Fishing Eagle tyrannizes over all *dhands*, scorning the lenten diet assigned to it by naturalists, and the White-tailed Sea-Eagle visits us in winter. The Black-winged Kite is found in the east and north. Of the five large falcons the *Laggar* nests on most towers, while the Peregrine, *Sháhin*, Saker and Barbary visit the Province regularly in the cold season; so do the Hobby and Merlin: the Red-headed Merlin and Kestril are common. The royal sport of falconry was much practised by the Mírs and is still in vogue.*

The Dove family is poorly represented in Sind, but the little Brown Dove is common in gardens and, with the Ring Dove (*T. risorius*), on the plains, while the small Red Dove (T. *tranquebaricus*) occurs locally. The Indian Stockdove (*Columba eversmanni*) visits us in winter and Captain Butler was positive that he saw *Palumbus casiotis*, the Eastern Wood pigeon, near Sukkur. Of Sandgrouse there are 7, of which the common Pin-tailed (*P. exustus*) is the only species generally distributed. The Imperial (*P. arenarius*) is found chiefly in the north, and so is the large Pintailed (*P. alchata*), while the Close-barred, Coronetted and Spotted (*P. lichtensteini*, *coronatus* and *senegallus*) keep west of the Indus. In continuation of the Sandgrouse we may take the other fowl which are called Game, passing by the Rails and Coots which ought to follow. Peafowl are not indigenous to Sind, but they have long been kept in a semi-domestic state and have quite naturalised themselves about Umarkot and the Eastern Nára. The Grey and

*See note on falconry under Amusements in Chapter IV.

Black Partridges are generally distributed and the Chukor and Seesee inhabit the western ranges, the latter coming down to within a few miles of Karáchi. The Grey and Rain Quails are uncertain, but often very abundant, the former in winter the latter in summer. The Common Crane, (*Sindhi Kúnj*) which visits us in numbers in winter, deserves to be ranked among game birds. There are three other species, including the Great white Crane (*Grus leucogeranus*), but scarcely the Demoiselle, or "*Kalam*" so abundant in Guzerat. The Indian Bustard is found in Thar and Párkar, where its eggs have been taken. The wandering Florican is said to have bred in southern Sind too, but is not common in any part. The Houbara spreads over the Province from September to March. **Birds.**

It is impossible to summarise in any way the list of our waders and shore birds, which number about 70 species, some rare and interesting. Sportsmen may note that the Woodcock has several times been shot in or near Karáchi and that both the common and Jack Snipe are common, but the Pintail very rare. There are four species of Storks, including the Adjutant, and 15 Herons and Bitterns besides the Giant Heron of Africa (*Ardea goliah*), which is suspected of visiting Sind. The Curlew remains on our coasts all the year, but has not been found breeding.

Seven species of Gulls and 12 Terns have been recorded from Sind, and the Skimmer (*Rhynchops albicollis*), which breeds on sand-banks in the Indus. The eggs of *Sterna saundersi* have often been taken at Karáchi and those of *S. melanogaster*, *minuta* and *seena* in North Sind. The Skua (*Stercorarius crepidatus*) is often seen on the coast, with the Masked Booby and other interesting ocean birds. All the three Indian species of Cormorants and the Snake-bird are common. Pelicans (*P. crispus* and perhaps other species) abound on the Manchhar Lake and large *dhands*. The Crested and Eared Grebes are met with about Karáchi and Dabchicks everywhere. Duck shooting is *par excellence* the sport of Sind and a list of *Anatidae* recorded from our waters may be useful.

The Common Swan, *Cygnus olor*. Swans were first shot in Sind, near Sehwán, by Mr. H. E. Watson in 1878, and during the unusually severe winter of 1899-1900 they were seen, shot, or captured

Birds.

alive, on the Hab river, at Kotri, Meting, Laki and on the Manchhar Lake. One was shot as late as 27th April.

The Whooper Swan, *C. musicus.* One specimen of this species was killed in the Kambar Taluka of Lárkána District on 31st January, 1904, and sent by Mr. J. Crerar, I. C. S., to the Bombay Natural History Society for identification.

Grey Goose, *Anser ferus,* (Sindhi *Hans*).

White-fronted Goose, *A. albifrons.* Rare in Sind.

Barred-headed Goose, *A. indicus* (Sindhi *Ráj Hans*).

The Comb Duck, *Sarcidiornis melanonotus.* The *Nukta* occurs only as a straggler in the south-east.

The Sheldrake, *Tadorna cornuta* (Sindhi *Tar niragi*). Commoner in Sind than in other parts of India.

Brahminy Duck, *Casarca rutila* (Sindhi *Mang*).

Whistling Teal, *Dendrocygna javanica* (Sindhi *Chiku*). Common only during the monsoon.

Large Whistling Teal, *D. fulva.* Said to occur. Barnes records a nest near Hyderábád.

The Mallard, *Anas boscas,* (Sindhi *Niragi,* female *Niragiani*).

Spotted-billed Duck, *A. pœcilorhyncha* (Sindhi *Hanjar*).

Gadwall, *Chaulelasmus streperus* (Sindhi *Buar*).

Clucking Teal, *Nettium formosum.* This rare duck has been obtained in Sind.

Common Teal, *N. crecca* (Sindhi *Háraro*).

Widgeon, *Mareca penelope* (Sindhi *Pharao*). This is sometimes the commonest duck on the coast.

Pintail, *Dafila acuta* (Sindhi *Drighush*).

Garganey Teal, *Querquedula circia* (Sindhi *Koraro,* or *Kararo*).

Shoveller, *Spatula clypeata* (Sindhi *Ginu,* or *Langho*).

Marbled Teal, *Marmaronetta angustirostris* (Sindhi *Chhoi*).

Red-crested Pochard, *Netta rufina* (Sindhi *Ratabo*).

Pochard, *Nyroca ferina* (Sindhi *Thorando*). **Birds.**

White-eyed Duck, *N. ferruginea* (Sindhi *Barnun*).

Scaup Pochard, *N. marila.* Once recorded from Karáchi.

Tufted Duck, *N. fuligula.* This occurs in Sind, though not abundantly.

Smew, *Mergus albellus* (Sindhi *Dyali* or *Jhali*).

REPTILES.

Reptiles. The species of lizards, snakes and other reptiles in Sind are more numerous than would be suspected by any one who had not made it his business to cultivate their acquaintance; but only those that in some way obtrude themselves on our notice can be mentioned here.

Crocodiles. (There are no "Alligators" in Asia.) The common Crocodile (*Crocodilus palustris,* Sindhi *Wágu*) abounds in the Indus and in all other waters capacious enough to accommodate it and gives to Mugger Peer its popular name. Eight or ten human beings and a large number of domestic animals are killed by them every year in Sind. One shot by Mr. H. C. Mules measured 12 feet 8 inches, and this appears to be about their limit, though old writers thought nothing of 15 feet and Sir Richard Burton ventured on 20.

The Long-nosed Crocodile, or Gavial (*Gavialis gangeticus,* Sindhi *Sesar*) grows much larger, but it is harmless, feeding on fish. It is confined to the river and commonest near the mouth of it. The fishermen entrap and kill a good many.

Freshwater Turtles. A large Turtle, probably *Trionyx gangeticus,* is very common in the Indus, basking on the banks with long neck erect. A smaller species, *Emyda granosa,* is said to inhabit *dhands* and there are probably others.

Tortoises. There are two species of land tortoises which *may* be found in Sind. Of water tortoises, which, unlike the turtles, are herbivorous and do some damage to rice crops, there are several.

Sea Turtles. The Edible Turtle, (*Chelone mydas,* Sindhi *Kachhau*) is common on the coast. It still lays its eggs sometimes on Clifton beach and often visits Manora for the purpose. Murray

Reptiles. says that the Loggerhead, *Thalassochelys caretta,* is also found on our coast.

Lizards. Among lizards the Monitor, sometimes misnamed the Iguana (*Varanus bengalensis,* Sindhi *Goh*), is common near water and grows to a length of 5 feet. Its skin is used for making native drums. The deadly Biscobra, of which natives have such tales to tell, generally turns out, when seen, to be a young Monitor, or else *Eublepharis macularius,* an ill-favoured, warty ground-lizard, which seldom exceeds 8 inches in length. House Geckos, garden and green lizards are not so much in evidence in Sind as they are in parts where insect food is more plentiful, but the species are numerous. The most familiar are the nimble little sand lizard, *Acanthodactylus cantoris,* and the heavy, grass-eating *Uromastix hardwickii,* which is mercilessly dug out of its burrow, wherever found, on account of its medicinal fat.

Snakes. The fearful mortality from snakebites reported in Sind after the British occupation at first gave rise to the suspicion that the snake was only a scapegoat; but after inquiry the suspicion seems to have been abandoned. The real explanation is undoubtedly the prevalence of the "Kapar" (*Echis carinata*), known in Bombay and the Deccan as *Phursa,* and in English called various names as fanciful as the notions of those who employ them. It is so small (rarely attaining to a foot and a half in length), that the quantity of poison which it injects scarcely suffices to cause the death of an adult man once in five times; but its numbers and inconspicuousness, together with its habit of lying coiled in the middle of a road, its sluggishness and bad temper, make it the most fatal snake in India. It is by far the commonest of the venomous species in Sind, especially in the Thar and Parkar District. Like most snakes, it is little seen in the winter, but becomes active as the weather grows warm; and doubtless the inundation about that time expels many from their hiding places and compels them to seek the inhabited areas. Next to the Kapar, the "Krait," (*Bungarus cœruleus*) is the commonest venomous species in Sind and its bite is far more certainly fatal. Since the volume on Snakes in the Fauna of British India was published a new species of *Bungarus* has been discovered in Umarkot and Sukkur and named *Bungarus sindanus.* It is very

Reptiles.

similar to the Krait in colour, but seems to grow larger. Of the Cobra (*Naja tripudians*, Sindhi *Kárihar*) there is little to be said. It is common here as elsewhere in India, the black variety being most frequently seen. Russel's Viper (*Daboia*, or *Vipera russellii*) does not appear to be so common as the others. It has the same indolent and snappish ways as *Echis* and is therefore very dangerous.

There are about fifteen kinds of Sea Snakes on the Sind coast, which are all venomous, but as they never bite anybody, it does not signify. Of non-venomous snakes there are more than 25 species recorded, the commonest by far being *Dipsas trigonata*, a yellowish grey reptile, with a white and black zigzag pattern on its back, which is often mistaken for *Echis carinata*, though it is much more slender in form and grows much larger. It is harmless except to cage birds, for which it has an unscrupulous avidity. The Python is found in Sind, though not commonly.

Government offers no rewards for the destruction of snakes, but certain municipalities do within their own limits. The Sukkur Municipality gives one anna a head, and that of Jacobabad two annas. There are also reports, from which it appears that about 1,670 snakes are destroyed per annum in the Hyderabad District and about 1,430 in Thar and Parkar; but the universal ignorance with respect even to the differences between venomous and innocent species deprives such figures of all value.

Fishes.

Sea Fisheries.

Sea Fisheries.
HISTORY.

There are probably few shores to which fish resort in greater number and variety than the coast of Sind. The Indus, one of the few rivers in India which flow all the year round and one which is as yet obstructed by no weirs, attracts those species, like the *Palla*, which breed in fresh water, while the food which its many mouths pour into the sea brings together countless small fry, which are food in turn to many predacious species. Others, like the sardine, of migratory habit, pass by periodically in countless shoals. For these reasons the fisher's craft has been carried on at and about Karáchi from time immemorial on a scale so much in excess of local requirements that the salting of fish for export has also become a great trade. The Amirs raised a

Sea Fisheries.

revenue of from Rs. 4,000 to 7,000 by farming out the right to fish, with the result that the fishermen became virtually slaves of the Bania contractors. The farmer could levy his dues in either money or kind according to a tariff truly oriental in its complexity and much too long for reproduction here. The fishermen were also subject to about ten different cesses of a miscellaneous nature, the collection of which must have maintained a host of harpies; Q. E. F. The British Government, in the hope of improving the condition of the fishermen, abolished the contracts in 1846 and adopted a system of licenses, but, this proving very unremunerative, the fisheries were again sold by auction in 1851. In 1858 this system was again condemned and licenses were issued to fishing boats on fees which ranged from Rs. 3 for a toney to Rs. 5 per ton on larger craft. Having paid this fee the owner of the boat was free to fish where and as he pleased. This system continued until 1884, when fishermen were relieved of all special taxes in view of the deplorable condition into which their trade had sunk since the abolition in 1867 of the import duty of 7½ per cent on salted fish. This had exposed them to a ruinous competition from the Makran coast, where there was no duty on salt. To meet this an import duty of 12 annas a cwt. was imposed by the Tariff Act of 1875 on salted fish imported into any part of the Bombay Presidency excepting Sind, which gave the Sindhi in his turn an unfair advantage over the fishermen of the Bombay coast, whom he could undersell in their own markets, for the duty on salt was only 8 annas a maund in Sind, but Rs. 1-13-0 in the rest of the Presidency. Three years later, however, the Bombay salt duty, which had in the meantime been raised to Rs. 2-8-0 a maund, was extended to Sind, and the Tariff of 1882 repealed the import duty on salted fish from Makran and elsewhere, with the speedy result that the Government of India was moved, in view of "the virtual destruction of the fish-salting industry in Sind," to insist on an experiment being made with yards in which salt should be issued to curers at cost price. By Bombay G. R. No. 8895, dated 11th November, 1884, the opening of four such yards was sanctioned. Three of them proved impracticable, but one was started on the 1st of May following at Shamspir, within the limits of Karáchi harbour, and has been maintained successfully to the present day, the average issue of salt per annum being 860

Sea Fisheries.

maunds and the outturn of fish 5,235 maunds. At first salt was issued at 8 annas a maund, but as this did not pay actual expenses, the rate was raised to one rupee a maund in 1896. In May 1904 another yard was opened at Khadda, close to the fish market on the west of Karáchi City, at which, in the eleven remaining months of that official year, 959 maunds of salt were issued and 14,672 maunds of fish cured. Measures are also taken to encourage curing with duty-paid salt, which is carried on extensively at Rehri in the creek east of Ghizri Bandar and at Kund in the Mutni channel, not far from Keti Bandar, and on board fishing boats. Permits to store salt at the two places mentioned are granted by the Collector of Karáchi, under Section 38 (2) of the Bombay Salt Act, and a Customs Munshi is appointed to control the traffic at each place, by whom, as well as by the Collector of Customs, similar permits are issued to fishermen desirous of curing fish on their boats. The aggregate quantity of salt for which permits were issued to fishing boats in 1904-05 was 838 maunds.

The effect of all these oscillations of the fiscal pendulum on the fishing industry may be fairly gauged by the following figures showing the value of total exports of salted fish from Karáchi for each quinquennium since 1855-56:—

1855-60	Rs.	1,04,508
1860-65	„	1,69,418
1865-70	„	2,19,783
1870-75	„	2,00,700
1875-80	„	1,66,975
1880-85	„	2,47,379
1885-90	„	3,30,214
1890-95	„	4,82,176
1895-1900	„	4,74,579
1900-05	„	6,26,610

Allowance must be made for the inclusion in these figures of an uncertain proportion of fish from Makran re-exported.

FISHERMEN.

It must not be supposed that the advance in the fishing and fish-curing industries evidenced by the above figures indicates a proportionate advance in the prosperity of the fishermen. When Dr. Day wrote his great Report on the Sea Fish and Fisheries of

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India, 1873, he was informed that the fishermen in Sind all borrowed money to purchase boats and nets, entering into a bond with the creditor to deliver their captures to him at half the ruling market rates; and their condition is very much the same at the present day. Their boats, if not actually owned by Khojas and Banias, are mortgaged to them on terms which usually include a right to the produce of all the fishermen's labours at a fraction of its value. The salting at the Goverement yards is entirely, or almost entirely, in the hands of a few wealthy men, who have the mass of the fishermen in their grasp and derive more benefit from the benevolent intentions of Government than the objects of them do. Nevertheless the condition of the fishermen as a whole appears to be fairly prosperous and very different from the pictures drawn of it sixty years ago. They are all Muhanas (see chapter on Population) and are divided into Karáchia, Lára, Vangúra and Bandri. These appear to be merely topical names, but probably indicated at one time differences of occupation wider than exist now. Even now the Bandri fish more with hook and line, the others more with nets. The Karáchia and Lára are said to intermarry freely, but not the others. There is a *Wadero*, or Headman, of each village, not each division, as Dr. Day reported to be the case thirty three years ago, and of perquisites and privileges he has retained none save the right to a marriage fee of a *gangi*, or Re. 1-4-0 in cash, when a marriage is celebrated in his village. In 1901 there were 30,580 *Muhanas* in the district, male and female, of whom only 1,639 were in the Karáchi Taluka. The majority were in Sujáwal (6,254), Játi (5,255), Mirpur Bathoro (4,562), and Shahbandar (4,550). Comparison cannot be made with the results of the previous census owing to the absence of taluka details in that, and the subsequent alteration of the limits of the Karáchi District. In a report printed in 1854, by order of the House of Commons, the number of fishing boats is given as 105 at Karáchi and 59 on the coast. There are now in all 238 fishing boats. Then, as now, Muhanas were not only fishermen but lascars, and also found employment in cutting and disposing of mangrove jungle and other produce of the creeks.

SPECIES OF FISH.

Dr. Day enumerates 160 species of marine fishes obtained by him on the Sind coast and there are many which he did not obtain. Only those which have some economic importance can

be noticed here. Of the kinds which are thought worthy of a *Sáheb's* table the following are the best known: of some the Hindustani, or bazaar, names are more familiar than the Sindhi. **Sea Fisheries.**

Stromateus cinereus (Sindhi-*Pithún*)—the Gray, or Silver, and *S. niger*, the Black Pomfret—"Paplit" of the bazaar. These are only to be had occasionally.

Drepane punctata (Sindhi, *Phano*: Dr. Day says "Punnur.") This is passed off for a Pomfret.

Cybium guttatum (Sindhi, *Gor*), the "Surmái." Also *C. interruptum* (Sindhi *Kakán*) *and C. commersonii* (Sindhi *Karghán*), which is very highly esteemed.

Clupea ilisha, the famous *Pallo* or "Pulla" of the Indus. Large numbers are netted off Karáchi harbour in March and April, when they congregate before ascending the river to breed.

Polynemus indicus, sextarius, plebeius and *tetradactylus*, all known as "*Seer*" (Sindhi, *Síari*), or Salmon Fish, in the bazaar. *P. sextarius* is the Bombay *Ráwas* and *P. tetradactylus*, the "*Bahmin*" *of* anglers. *P. indicus*, distinguished in Sindhi as *Sír Photái*, is specially esteemed and yields the best maws.

Mugil waigiensis (Sindhi, *Mori*) and another species of Mugil (Sindhi, *Phár*) known in the bazaar as Mullet, or Bhoi.

Crenidens indicus and *forskalii* (Sindhi, or Baluchi, *Kisi*) *Sargus noct*, *Chrysophrys sarba*, *bifasciata* and *berda* (Sindhi, *Dandio*). These and some other *Sparidae* and also *Diagramma nigrum*, or *cinctum* (Sindhi Muí), are known as Rock Fish, Stone Fish and "Istone Fish." Some of them are very good.

Synaptura orientalis (Sindhi, *Pháni*), the Sole. *Plagusia bilineata* (Sindhi, *Chháil*) and Pseudorhombus sp? (Sindhi, *Hajám*) inferior kinds of sole.

Harpodon nehereus, the Bummaloh, or "Bombay Duck." Only plentiful on occasions.

The following and many other species are also sold in the markets.

Clupea longiceps (Sindhi, *Lúar*, Marathi, *Tárli*) the Oil Sardine. It visits the coast periodically in vast shoals, but is seldom seen

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on the tables of Europeans. Several inferior species of herrings, such as *C. fimbriata* and *lile* and *Engraulis malabarica*, (Sindhi *Kareri, Padan*) are also sold as Sardines. *Scomber microlepidotus* (best known by its Marathi name *Bángda*). This mackerel is abundant and cheap and most excellent, but our servants do not class it as food for *Sáhebs*.

Lates calcarifer (Sindhi *Dhángro*). A grand fish, growing to 5 feet in length. It frequents the mouths of the river and is esteemed excellent eating.

Serranus lanceolatus (Sindhi, *Gissir), S. diacanthus* (Sindhi *Dambo*) and several other species of the genus.

Pristipoma hasta (Sindhi, *Dothar*) and others of the genus. *Sciœna sina* and perhaps *S. miles* (Sindhi, *Súa*) salted in greater number than any other fish. Also *S. axillaris* (Sindhi *Gol*) *S. coitor, S. glauca* and others.

Chorinemus sancti-petri (Sindhi, *A'l*), one of the chief species salted.

Mugil dussumieri (Sindhi *chhodi*), plentiful and cheap.

Bellone strongylura, (Sindhi *Kango*), the "Ghar Fish."

Less esteemed but freely eaten by Muhánas, Makránis and Negroes, are "Cat fishes" *Arius thalassinus* and others (Sindhi, *Khago*), and Sharks (Sindhi, *Mangro*) of several species and the Sawfish (Sindhi *Mor-Mangar*). The flesh of the sharks is considered to be very strengthening and they are salted for export in great numbers.

SALTING.

Almost any of the abovementioned species may be salted when caught in larger number than can be disposed of at once; but the export trade is dependent mainly on a few species, such as the *Súa, A'l, and Dothar*, which visit the coast in vast shoals from March to May and again after the monsoon. Of the first named as many as 25,000 are said to have been brought to the Khadda yard in one day, all large fish. Cat fishes (*Khaga*) and Sharks (*Mangra*) are also cured in large quantities. The method of curing is different from those followed in other parts of India and on the Makran coast. Each fish is deftly slit up, the sound, or "maw," removed if there is one, the rest of the entrails cleaned out and salt sprinkled on it. After lying for a night it is laid out in

the sun to dry. Sharks are differently treated, being cut up into small strips. The quantity of salt used varies with the species and condition of the fish. One maund of salt to five of fish is considered a fair proportion, but much less is often made to suffice. Of the fish cured at Karáchi very little is consumed in the Province. Roughly speaking 20 per cent. of it goes to East Africa, as much or more to Burma, rather less to Colombo and the balance to Bombay, or elsewhere *via* Bombay. **Sea Fisheries.**

SHARK-FINS, MAWS AND FISH OIL.

Other products of the Sea Fisheries are Shark-fins, Fish-maws and Liver Oil. The fins of Sharks, Skates and Saw-fishes are cut off, rubbed with salt and dried in the sun for export to China, where, being rich in gelatine, they are said to be convertible, like birds' nests, into a luxury for the table. They are divided into "White" and "Black," the former being worth one rupee a lb. and the latter half as much. Maws are the sounds, or air vessels, of certain fishes, from which isinglass is prepared, and are exported to the United Kingdom as well as China. The principal fishes which yield this product are those of the genera Serranus, Sciæna and Polynemus mentioned above, the best being those of *Polynemus indicus*. The Siluridae also yield maws and are sometimes killed in the creeks for this alone, the bodies being thrown away. The maws, cut out with as little delay as possible after the fish is caught, and split, are flattened, and dried. They are worth from a rupee and a half to two rupees per lb. The total exports from Karáchi in 1904-05 of Shark-fins and Fish-maws, which are classed together in the trade returns, were valued at Rs. 1,90,380, of which nearly one half went to Hong-Kong direct. The United Kingdom took Rs. 39,800 worth and the rest was sent to Bombay for re-export. The oil extracted from the livers of Sharks, Skates, Rays and Saw-fishes is a valuable product, but in Karáchi it is all used up locally for the curious purpose of greasing the bottoms of fishing boats. Therefore no attempt is made to purify it. The livers are cut up, slightly salted and boiled down and strained. Even in this state the oil is worth from 8 to 10 rupees a maund: a maund is rather more than 8 gallons. The total produce is estimated to average about 1,000 maunds a year.

PRAWNS.

Fresh prawns are not so often seen on the tables of Europeans in Karáchi as in Bombay, but the capture of them forms an

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important branch of the fisherman's trade in the creeks to the east. The Sindhi name is *Sáno,* different species being known as *Kalri Sáno, Jero Sáno,* etc. *Kikut Sáno* is the large dark green kind which does duty in India for the Lobster. Prawns are caught in nets and at once boiled, dried and sent to the godowns of contractors at Karáchi. Here they are beaten with sticks to remove their shells and packed in sacks for export. In this state they are worth Rs. 9 a maund. The powdered shells are not lost, but carefully swept up for export to Cochin, or Malabar, where they are valued as a manure.

METHODS OF FISHING.

The following are the principal nets employed on this coast. *Pakhi.* This is a net of wide mesh used for catching sharks and large fishes that swim low. It is made in lengths of from 100 to 400 feet, which are connected at the ends and sunk to the bottom by means of stones attached to all along one side. The other side is held up by buoys of *bahan* wood which float above and indicate the position of the net. This is said to cost from Rs. 50 to 200 per piece.

Dhak is a net of smaller mesh, which is not sunk, but kept at the surface by floats, as many as a hundred pieces, each 25 feet in length and 12 in breadth, being connected together so as to enclose whole shoals of large fish, like the *Sua.*

Darbando and *Lúan* are nets somewhat similar to *Dhak,* used in catching "Seer," *Dothar,* etc.

Rachhro is another seine net, made in lengths of 100 feet and kept up by very small floats, which is used exclusively for catching pomfrets (*Pithún*).

Pattiun is a net of small mesh, made in sizes of 50 feet by 6. which is used in shallow water for catching small fish and prawns. As many as a hundred pieces may be connected, end to end, and attached to a curved line of upright stakes. While the tide is setting the net lies on the bottom, but at the turn of the tide one side of it is raised by means of a cord running along the stakes and the retreat of the fishes cut off.

There is also a net called *Wâw, Jalarô,* or *Ar,* which is used for catching prawns in the creeks. It consists of two nets of the same type as *Pattiun,* which are inclined towards each other like

a V, and at their junction a large, loose bag. The arms may be 300 or 400 yards in length. They are raised when the tide is full and when the ebb sets in they guide the prawns into the bag, from which they are easily emptied into the boats.

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Lastly there is the *Jári*, or circular casting net for shore fishing, so familiar in Egypt and all over India. When skillfully thrown, it spreads to its full extent under the centrifugal force of the small lead weights round the circumference, and drops on the lurking fish, or shoal of fry.

Line fishing is also extensively carried on upon the Sind coast both from the shore and from boats at anchor near banks.

A harpoon (*Dáph*) with the device of an easily detachable head, which must have been invented early in the history of man, is used to kill Sharks and Saw-fishes. Enormous specimens are sometimes killed. The upper fluke of a dried Shark's tail in a godown at Khadda measured 5 feet 11 inches.

The fishermen make their own nets, but they are either more lazy or less ingenious than those of the Konkan coast, who grow their flax and spin their cord (*i. e.* make their women do it). The Sindhi uses imported materials. The nets are stained with a dye of *Vilayati Kirar* (*Parkinsonia aculeata*) bark and lime made from the shells of *Telescopium fuscum.*

The boats used in fishing have finer lines than cargo boats generally and average ten tons burden. If the stern is pointed like the stem, they are known as *Kelsi*, but if the stern is square, as *Batel.* The cost of a large fishing boat complete may be Rs. 650 or 700. Tonies, called in Sindhi *Hora*, are very much used in the creeks, of all sizes from a tonnage of about 1¾ down to tiny craft with scarcely sitting accommodation for one. The best come from Cochin and are hewn out of a single trunk, but after arrival the sides are often built upon to increase their carrying capacity.

OYSTERS.

The natives of Sind, very unlike those of the Bombay coast, do not eat shell-fish, but they collect Oysters (*Kado*) for the market, and the Oysters of Karáchi once had a great reputation. If they ever deserved it, they must have been well nigh exterminated by the reckless way in which the banks were cleared, for more than 90 per cent. of the oysters sold in Karáchi now come from the coast of Cutch and Káthiawar. The quantity thus

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imported in 1902-03 was 21,600 dozen. Each boat carries from 1,000 to 2,000 dozen, which are kept in water at Khadda till disposed of. As the voyage takes three or four days, the freshness of the Karáchi oyster is no longer above suspicion. Recently efforts have been made to protect the native from extermination. In 1896 a notification was issued closing the beds from Ghizri to the Habb for two seasons. Since that a close season has been observed from 15th April to 1st October and the removal of shells less than two inches or more than six inches in diameter has been forbidden. Since 1903 the expedient has been tried of closing the eastern and western sections of the coast from Ghizri Bandar alternately for periods of two years, so as to give the oysters that period for growth and reproduction. At the same time experiments are being carried on in the harbour under the Head Preventive Officer of the Customs Department.

PEARL OYSTERS.

The true pearl oyster (*Meleagrina*) is not found on the Sind coast, but the "Window Oyster" (*Placuna placenta*), so called because its thin, translucent, flat shells were extensively used as a substitute for window glass in the days when that commodity was scarce and costly in Bombay and are so used in Goa to this day, is very plentiful in Karáchi harbour and the creeks to the east, lying flat on the bottom in shallow water. In nearly 5 per cent. of the mature shells of this species pearls may be found, which, though small and often ill-shapen, are worth 15 rupees a tola by weight all round. Only the best are fit for the purposes of the jeweller, but the rest are used in native medicine and are also calcined to make the precious powder with which native ladies beautify their eyelids and those of their children. The Mirs are said to have discovered the existence of these oysters only about 1836, when they sold the right to collect them in the creeks east of Ghizri for Rs. 500. Next year a much large sum was offered, but the lessees could not make the business pay, so the Mirs tried it themselves, but eventually abandoned it on the same ground. Under the British Government the banks have been leased periodically for very variable amounts. Thus in 1849 the large sum of Rs. 6,265 was realised and in 1850 Rs. 5,275. For the next four years the banks were not leased, after which, in 1855, they fetched Rs. 4,900. After lying unrented for some years again they fetched Rs. 5,000 in 1862, but the average annual revenue obtained from them

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during the twenty years ending 1864 was only Rs. 2,487. As the right was usually sold for one year at a time, the lessee had no interest in the future, and his contract appears to have placed no restriction whatever on his operations; so it is not to be wondered at that in 1872 Dr. Day found the banks very much impoverished. He recommended that they should only be let once in three years and then under strict conditions of a protective nature. But these remedies suppose a supervising establishment which it would not pay to maintain. Without such an establishment to leave the banks unlet is to abandon them to the local fishermen, who are possibly worse than a contractor and pay nothing to Government. Upon the whole the best policy appears to be to give the contract for long periods and so make it the contractor's interest to save the goose that lays his golden eggs. Recently the beds have been leased for periods of three years. In 1900 the bid was Rs. 3,650, but the lessee lost money on the business, so his period was extended to four years without additional payment. In 1904 the highest bid for three years was Rs. 1,851, which was accepted.

Freshwater Fisheries.

Freshwater Fisheries. PROTECTION.

The Freshwater Fisheries of Sind are extensive and rich and have three claims on the care of Government, first as an almost indispensable source of food for poor and rich,* secondly, as a means of livelihood to a large section of the people, and thirdly, as a source of revenue. The last offers a measure of the importance of the other two. The right to fish in the river Indus, and in all Government canals and *dhands*, is sold by the British Government, as it was by the Mirs, and the annual revenue derived from this source amounts to about Rs. 1,09,467. The arrangement made by the farmer who purchases the right with the fishermen who catch the fish is usually that he is to receive a third of all the latter catch, so the market value of the fish taken annually must be three times the above-mentioned sum, *plus* three times the profits of all the farmers; and the income derived by the fishermen must be at least twice the amount of the revenue.† It is

* "So great is the importance of fish to the enjoyment of the rich and the necessities of the poor, that man might, with less inconvenience, give up the whole class of birds, and many of the mammalia, than be deprived of the finny tribes." *Linnæus.*

† This calculation assumes that the farmer deals honestly and is perhaps vitiated by that assumption.

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obvious that fresh water fisheries are much more under the control of man than those of the sea and may be conserved and improved by wise care, or ruined by carelessness and avarice, as indeed they have been too often throughout India. The attention of the Government of Madras was first directed to this subject by the Secretary of State for India in 1867, and Surgeon Major Francis Day, one of the most distinguished naturalists that India has produced, was deputed to report on the fisheries of that Presidency. His inquiries were afterwards extended to all India, including Sind, which he visited in 1872-73. He found that there was no undue and preventible destruction of small fish in Upper and Central Sind, owing, first, to the paucity of the population, secondly to the rapidity of the current of the river and the constant variation of its channel, and thirdly to the security that the immature fish obtain during the inundation season. He might have added that the Sarkar's right in the fish had protected them from destruction by poison and other methods adopted too commonly by villagers in other parts of India. He made a few suggestions, however, and he earnestly opposed the efforts of the Public Works Department to have fishing altogether prohibited in many places on account of the damage which fishermen were alleged, or suspected, to do to the *bands*. As his reports were printed and circulated by Government, they doubtless had their influence on the conditions on which the farms have since been sold; but the population is increasing, new canals fraught with many perils to fish are being opened and other circumstances are changing; so there is constant need for watchfulness. There are also conflicting interests involved, and it is unavoidably the case that the officers who are entrusted with the letting of the farms are more directly responsible for other interests than those of the fisheries. For these reasons a brief account of the fish, the fishermen and the fishermen's methods throughout the Province may be useful.

KIND OF FISH.

Dr. Day enumerated 64 species of fishes which he found in the fresh waters of Sind, and there are a good many more which he did not find. They are almost all eaten by some class and have vernacular names; but these are known to few except fishermen and are sometimes local; so identification is difficult. Only the most prominent need be mentioned here. From every point of

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view the most important is the *pala* (*Clupea ilisha*), known as the Hilsa in Bengal, a sea-fish of the same genus as the herring, which in February and March ascends the Indus in enormous numbers for the purpose of spawning. At this season it is caught in the sea at Karáchi and in the Indus at every favourable spot. It is esteemed by both Europeans and Natives as the very best fish for the table in Sind, if not in all India; and this would scarcely be disputed if the disposition of its countless bi-and trifurcate bones were within average human comprehension. There are "Pala cooks," however, who are said to be able to put it on the table in a boneless form. Fancy prices are given for it at Hyderábád and Sukkur at the beginning of the season. Later on they become so abundant that they sell for one or two annas each. They do not keep well and should be eaten very fresh; but large quantities are salted. The commonest method of catching the *Pala* is one of the original things which the Sindhi does. The instrument used is a bag-net attached to the end of a very long pole forked at the end. The limbs of the fork are about 5 feet in length and keep the net open, like a huge butterfly-net, as long as a double cord which runs along them is kept taut. As soon as this is relaxed the net collapses. The fisherman launches a very wide and flat chatty, or earthern pot, with a small mouth, and laying himself on it, so that his belly forms a close-fitting stopper to its mouth, he floats gaily down-stream, guiding himself by kicking the water with his feet like a somewhat paralytic turtle. The net is now let down perpendicularly like an inverted Y, the cord being drawn tight with the right hand. As soon as a fish, driving against the strong and muddy current, strikes the bag, the man lets the cord go, the net collapses and is folded and rolled by the current. It only remains to draw up the net, stab the fish with an iron spike carried in the girdle and introduce it into the chatty. How this is achieved without collapsing and foundering is a mystery of acrobatics. Sometimes the fisherman floats by means of a kind of life-belt made of gourds instead of the chatty; but this is unsportsmanlike. When he has reached the bottom of his beat he comes to the bank, shoulders his chatty and net and trudges up the bank to begin again. It should be mentioned that the mesh of the *Pala* net is about 7½ inches in circumference, so that only fish of fair size are caught in it. Another species of herring,

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Clupea chapra, which grows to only 9 inches in length, is found in the Indus and believed by the fishermen to be the young of the Pala. When the spawning time is over the *Pala* return down the river to the sea, but they are then out of condition and not worth catching.

After the *Pala* the most important fish in Sind is the *Dambhro* (*Labeo rohita*), known in Punjab as the *Rohu*, a noble carp, which may grow to a length of 3 feet. Three other species of the same genus, *L. gonius*, *calbasu* and *dyochilus*, all fish of large size, are known in Sindhi as *Siriho*, *Dáhi* and *Nugari*, or *Nigari*. The Carp family supplies several other fishes good for the table, *e. g.*, *Morákhi* or *morákho* (*Cirrhina mrigale*) and *Thelhi* (*Catla buchanani*) the latter of which is said to grow to a length of 6 feet. These all inhabit the Indus, but spread over the country during the inundation and breed in the weedy and reedy *dhands*. When the *dhands* are isolated and contracted by the drying up of the water, much mischief may be done by the wholesale destruction of the fry in them. Myriads of fry perish annually without man's malice by following the distributing channels of the canals and being unable to return. On the other hand, stocking tanks with some of these species and preserving them has proved a profitable enterprise in other parts of India and might in Sind.

There is another class of fishes which, though considered by us coarse and unsavoury, is preferred perhaps to the more delicate kinds by the common people and at any rate constitutes a much larger proportion of their food. These are the "Cat-fishes" and other Siluridae, which include a number of species of enormous size that contribute much to the value of the fisheries in the Manchhar Lake and large *dhands*, and also in the canals that lead to them. Of these may be mentioned *Khago* (*Rita buchanani*), *Lohar* (*Saccobranchus fossilis*), *Singári* (*Macrones aor*), *Muli*, or *Poiki* (*Wallago attu*), and *Diman* (*Callichrous bimaculatus*). The last in particular is considered a good fish for the table. So are the Murrels (Sindhi *Jarko*, *Ophiocephalus striatus*, &c.), which are found in weedy tanks. The *Goj*, (*Mostacemblus armatus*) a mud fish, and the *Gandan* (*Notopterus kapirat*) and *Phandan* (*N. chitala*) may be added to this list.

Finally there are many species of small size, or poor flavour, which are pursued with hook, net, or basket, in every water from

the Indus to the roadside ditch, and contribute a not unimportant item to the food of the poor.

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CONTRACTS.

The men who buy the right to fish are almost invariably Banias, or rich men of some other caste, who make terms with the fishermen. The latter belong to one or other of the sub-castes of the *Muhánas*, or *Mirbahars.* The conditions of the contract on which the farm is sold usually oblige the farmer to employ these men and forbid him to sublet. The arrangement made between him and them is usually based on a division of all spoils, the contractor's share being from ⅓ to ⅖. He can improve upon this by buying their share also, which they will generally sell on the spot for less than a half of its market value.

WAYS OF FISHING.

There is comparatively little fishing in the Indus, except for *Pala.* Its strong current and shifty banks are unfavourable: at any rate its backwaters and the canals and *dhands* fed by it are better. The means used vary of course with the kind of fish to be caught and the kind of water to be fished. The *Pala* net has been described. The canals are fished with standing nets (*Jári)* attached to stakes, and weirs made of stakes and bushes, with a bag net at the only opening; and with long rectangular nets held by two men who walk up the canal, one on each side. *Dambhro* and other carps will leap over a standing net, so a second strong net, running like a pocket along and behind the first, is provided to receive them. This is a common device and is called *Pathro.* In *dhands* and *dhoros* the main net sometimes takes a spiral form, guiding the fish into a narrow inclosure, which prompts them at once to leap into the fatal pocket. The fisherman has only to come and empty the pockets at intervals. On the Manchhar Lake a net of this kind is formed into an enclosure like an elephant "Kheddah," into which hundreds of fish are driven by boats filled with men, women and children, making a pandemonium with metal pots and boards and sticks. Fine seine nets (*Naro)* are also used and long drag-nets (*Paneth* and *Bhan*) drawn by boats. The ordinary casting net (*Rachh*) is common and very useful in pools, and another net (*Kurhi*), stretched on a bell-shaped wooden frame, is clapped down on fish seen in shallow water. Another method of catching *Dambhro* has been thus described by Dr. Day and is worth noting as illustrating one of the ways in which canals may become fatal to breeding fish :—"About half a

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mile from its origin it (the Rohri Canal) is crossed by a bridge and this is furnished with sluices which can be kept open or closed in accordance with the amount of water it is considered desirable should be allowed to enter. A little further on is a fall in the bed of the canal. The fishery at this bridge is one of the principal ones from which the surrounding country is supplied with Dumra fish for one-and-a-half or two months in the year. As the yearly floods commence these fish go into the *dhands* for breeding, but as soon as the waters begin to subside (as about September) they attempt to return to the Indus and for this purpose many have to ascend the canal. Arriving near the bridge the current is too strong and they attempt to jump over the obstruction to their onward progress. Unable to pass through the bridge owing to the great force of the water rushing through the undersluices, they spring at the piers of the bridge; and an apparatus resembling a native cot turned upside down, or a cloth, or a basket, or anything equally suitable, is hung over the sides of the piers and into which they fall." In places where the lotus and other weeds are so thick as to impede netting, fish are killed with spears, or rather javelins. These consist of straight and light reeds 8 or 9 feet long, with barbed iron heads. The fish are struck from boats as they lie at rest near the surface. Fishing with hook and line is practised everywhere.

PORPOISE FISHING.

Though porpoises are not now fishes, the catching of them is still a branch of the ignorant fisherman's trade. They are caught with a strong net about 6 feet in diameter, stretched on two cross-sticks, which are a little bent so as to make the net concave. The porpoise is lured into some pool near the river bank, where there are fish, by turning in tame otters. The noise that these make tempts the porpoise, which is sightless, to rush in and share their feast. The fisherman, standing near, claps the net on it and despatches it. Otters are often kept by the *Muhanas* and used for driving fish. They keep many tame waterfowl too, Egrets, Herons, Cormorants and even Pelicans. The Egrets are regularly plucked of the white plumes known among milliners as "Ospreys," which always command a high price. It does not appear that the other pets are turned to much account, unless they bring luck to the boat.

HILL STREAMS.

In such of the hill streams as retain any water throughout the

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year there are fishes of different habits from those which inhabit the plain, and their situation makes it much easier to exterminate them; but the country through which these streams run is so thinly populated that they have little economic importance and not much is known about them. Dr. Day visited the Sita Nai in the Upper Sind Frontier District and two others and obtained the following species of fish; *Botia dario, Labeo diplostomus, Scaphiodon watsoni, Cirrhina dero, gohama, sindensis, reba* and *mrigana, Chela bocaila, Wallago attu, Nemacheilus sinuatus* and *Barbus tor*. The last is the famous Mahseer, (Sindhi or Baluchi *Kária*). It attains to a good size in the pools of the Hab river, whither anglers resort from Karáchi in quest of it.

Particulars of the fisheries in the different districts of Sind and the terms on which they are let &c., will be found in the B. Volumes. The fisheries in the Indus and in all detached *dhands* and those which depend on the inundation are sold by the Land Revenue Department and the proceeds are credited in that Department; but the fisheries in canals and *dhands* filled by them are sold by the Public Works Department and the proceeds credited to it. The conditions of the contract in the latter case are particularly directed to the protection of the canals and their *bands* from injury by the fishermen.

Mineral Products.

Mineral Products

ALUM.

At various places in the Khirthar hills, beds are found among the limestone of a kind of shale from which Alum is manufactured by a rough and simple process. Ranikot, Bill, 12 miles north of Thana Shah Beg, and other places are mentioned in connection with this manufactare; but the quantity is evidently insignificant and the quality crude.

BUILDING STONE

Building stone of good quality is to be found in all the hilly parts of Sind. The best is a light yellowish-brown, fine-grained limestone belonging to the "Ranikot" beds, almost the oldest sedimentary rocks in Sind (see article on Geology), which is much used at Jerruck in Muhammadan tombs. The condition of the carvings and inscriptions on those are a certificate of the quality of the stone. The nummulitic limestone of the "Khirthar" beds is much quarried and used for building purposes at Sukkur, Hyderábád and Kotri. The porous, yellowish limestone of which

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Karáchi houses are built is obtained from out-crops of the more recent "Gaj" beds at Ghizri and elsewhere. There is much variety in the colour and quality of these limestones, even of those belonging to the same geological group. Mr. Blanford thought that some of those in the "Khirthar" group were so fine-grained as possibly to be suitable for lithographic purposes. There are also beds of calcareous sandstone in many places which make good building materials.

CARBONATE OF SODA.

Mention has elsewhere been made of the salt lakes and *dhands* in the desert of eastern Sind. In some cases the water of these *dhands* is impregnated with carbonate of soda instead of, or in combination with, common salt. As the water dries up in the hot season the alkali is deposited as a thick white crust on the bottom, and has only to be dug out and dried. It is sold throughout Sind under the name *Cháního* and used as "washing soda." The best quality (also called *Phuli*) enters into the composition of the pulse-biscuits, or curry wafers, known in Sind by their Marathi name *páper* and to Anglo-Indians everywhere as "Poppers," or (in Madras) "Poppadums." For this reason the common trade name of *Chaniho* in Bombay is *Páper-khár.* The right to excavate *Chaniho* at 10 or 12 places in the Nasrat Taluka of the Hyderábád District is farmed annually for about Rs. 1,700. The quantity excavated varies with the heat and dryness of the season, ranging from 500 to 2,000 maunds. A considerable revenue used to be raised from the same source in the Thar and Párker District, but it came to the notice of the Salt Department a few years ago that some of the so-called *Cháního* removed from the deposits there contained as much as 70 or 80 per cent. of chloride of sodium and was presumably intended for the same use as common salt. After some controversy between the Salt and Land Revenue authorities Government decided that, whenever the proportion of chloride of sodium exceeded 50 per cent., the stuff should be chargeable with duty as salt. Under this order a large proportion of the contractors' stocks became contraband and the traffic stopped. A pure quality of *Cháního* is produced in great abundance in the Khairpur State and exported to Bombay. The exports from that State last year were valued at a lakh of rupees, but this was exceptional. The average has been about a third of that.

A crude, black Carbonate of Soda known as *Khár*, which is a "barrilla" made from the ashes of plants, is also much used in Sind. The province abounds with plants of the genera *Salsola*, *Sueda* and others, rich in alkali, and the manufacture of both soda and soap seems to have been general until improved communications enabled the Punjabi to undersell the local maker; but *Khár* is still made in Shahbandar and other places. **Mineral Products.**

Celestine (Sulphate of Strontia) was found by Mr. Fedden of the Geological Survey of India scattered in crystalline lumps about the size of a walnut over the surface of the limestone hills of Kohistan, especially on the east of the range which lies to the eastward of Thana Bula Khan, the headquarter town of Kohistan Mahal. CELESTINE.

In 1857 there was a good deal of excitement in Sind over the discovery of coal at a place called Lainyan, or Leilán, 27 miles north-northwest of Kotri, the terminus of the railway then about to be constructed from Karáchi. The first seam, only 40 feet from the surface, was said to be 8 feet thick, with another below it. The result of an analysis of specimens sent to England was pronounced "highly satisfactory" and local trials on the Indus gave even more gratifying results. A local paper (The Sindian, 1857) published a glowing account of these trials, from which the following extracts are taken:— COAL.

"The recently discovered Scinde coal was this morning tried on board the Honourable Company's steamer *Nimrod*, and I am glad to say with the most gratifying results. It is now proved to be a coal perfectly well adapted for steam purposes. The *Nimrod* is a steamer of 60 horse power, and her boilers being tubular, her furnaces are well adapted for burning coal. The following gentlemen were present at the trial, *viz.*, Captain Daniell, I. N., Lieut. Searle, I. N., Captain Groube, 13th N. I., Messrs. Morris and Hughes, Chief Engineers, and the Deputy Collector, Captain Phillips.

"At twenty minutes past eight, steam was up, and the steamer then weighed anchor, and proceeded at a rapid rate up stream, presenting the gratifying spectacle of the first steamer seen on the Indus, steaming with coal—the produce of the Province. The wind was blowing strongly up stream, and the pressure of

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steam obtained on the square inch was from $6\frac{1}{2}$ to 7 lbs. This is a fair average pressure. On returning down stream, with the wind a-head, the draught was much increased, and the steam gauge showed a pressure of nearly 9 lbs. to the square inch, the steam consequently blowing off, as 8 lbs. is the highest working pressure. This speaks much in favour of the power of the coal. The vessel was under weigh one hour, and ran eight miles, four up stream and four down. The coal consumed was one ton and four cwt., *viz.*, fifteen cwt. in getting up steam, and nine cwt. when under weigh."

"The whole affair is promising, and the time may not be far distant when the Scinde Coal Pits may supply the whole of Western India with this valuable fuel."

Mr. Inman, a coal expert, was at once deputed to sink a shaft and make a formal examination. He found that the bed thinned out so rapidly that in a second shaft, sunk only 100 yards from the first, it had dwindled to a thin layer, which at first escaped notice when the shaft was being driven through it. In short there was "nothing which could properly be called a coal seam, but merely a mass of lignite not extending much more than 50 yards in any direction." The quality also was inferior. The mineral was "a lignite, brittle and abounding in iron pyrites, so that rapid decomposition sets in on exposure and there is much liability to spontaneous combustion." So no Sind Coal Company was started.

FULLER'S EARTH.

The shaly beds which are intercalated in the limestone on the western slope of the hills south of Rohri and also at places near Hyderábád, Jerruck and Tatta, contains a soft, yellowish clay, which is excavated and sold all over Sind under the name of *met*.

The best *met* is obtained from the Ganjo Hills four miles south of Hyderábád. It is found underneath the upper stratum of limestone and is extracted by sinking shafts from 15 to 20 feet deep into the rock. It possesses detergent properties and is much used by Natives, both Hindus and Muhammadans, as a substitute for soap. The finest quality is occasionally eaten during pregnancy by women. The privilege of extracting it at the above-mentioned place is auctioned every year by Government for a sum which averages Rs. 4,700, the lessee being bound not to

remove more than 15,000 maunds in the year. The clay is sold in Hyderábád at Rs. 75 to Rs. 100 per 100 maunds for the first sort, Rs. 50 for the second and Rs. 36 for the third sort. The cost of production does not exceed Rs. 7 per 100 maunds, that being the price paid to the miners, but the lessee has also to pay the wages of the overseer appointed by Government to weigh the amount extracted and of the two policemen who guard the mine. The clay extracted from the Ganjo Hills is recognised as superior to that found elsewhere and is exported all over the Province. Another mine, worked under somewhat similar conditions, is in the hills south of Rohri. **Mineral Products.**

GYPSUM.

Gypsum is abundant in Sind. It forms in crystalline lumps on the sides of the brine pits in the Maurypur Salt works, and beds of it, 3 or 4 feet thick, are found in the limestone of the Khirthar hills at many places. Blanford's Memoir on the geology of Western Sind mentions especially two exposures of such beds on the banks of the Gáj river. Excavation is allowed on payment of a nominal fee. It was probably more in demand (for the preparation of stucco) in the days of the Mirs than it is now, but it is still used.

IRON.

Iron ore of a kind occurs in many places in Sind and sometimes in sufficient quantity to allow of regular smelting, *e. g.*, in the Kotri Taluka, northwest of Kotri and east of Band Viro; also in the hills west and southwest of Jerruck. But the little manufacture that went on at such places has long since been extinguished by the cheapness of iron imported from Europe.

LIME.

Limestone suitable for making lime is obtainable in Sind wherever there are hills, excepting in parts of the Karáchi district where only sandstone prevails. Lime-burning is carried on therefore at one place or another as the demand arises. Sukkur is one of the principal centres of this industry. Sea shells, from which nearly all the lime used in Bombay is made, are never employed for this purpose in Sind except by fishermen on the coast, who make the little lime that they require for preserving their nets by burning shells.

PETROLEUM.

It was believed at one time that there was a probability of petroleum being found in the neighbourhood of Sukkur and experimental borings were made under the direction of Mr. T. H. D. LaTouche, Superintendent, Geological Survey of India. The

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actual drilling was commenced on 19th December, 1893, at a place not far from the N. W. Railway workshops. The work went on steadily till March, 1895, when a depth of 1023 feet had been reached. Indications of gas, supposed to be carbon dioxide, were observed at 785 feet and water was struck at 865. At this time the attention of Mr. LaTouche was directed to a place on the other side of the river, near to a village about 8 miles south of Rohri, where there were distinct traces of oil oozing out of the soil at no great depth, and he calculated, from the distance of this place and the dip of the limestone beds, that the horizon at which oil might be found at Sukkur would probably be about 1600 feet. But soon after this, when the boring had reached a depth of 1500 feet, Mr. LaTouche left and the conduct of the operations was handed over to the Railway. There is nothing on record to show what more was done, but it appears likely that the matter was dropped in view of the very unsuccessful issue of the experiment so far.

SALT.

Kalar soil, from which salt can be extracted by simply pouring water through it and evaporating the liquor, is abundant in most parts of the Province and was one of the principal sources of salt supply. The process of manufacture is described under Salt Revenue. The use of it was prohibited in 1878, when a large saltwork for the manufacture of licit salt was opened at Maurypur near Karáchi, but salt is still illicitly manufactured from *kalar* in many parts of the Province on a small scale. Deposits, varying in quality from a mere saline efflorescence, rendered unfit for human consumption by the presence of magnesium sulphate and other salts, to a solid mass of crystals of almost pure sodium chloride, are found in Sind wherever the sea penetrates at spring tides, and also wherever water percolates through a soil highly impregnated with salt. Such deposits are of course very numerous in the Karáchi District, with its extensive coast line. Those of Sirganda deserve special notice as they are quite unique and were regarded by Sir Bartle Frere and his contemporaries as one of the most valuable resources of the Province. They occupy an area of several square miles on both sides of the Sir creek, about 10 miles from its mouth, and are said to be two feet deep in parts. The crystals are of very large size, more like the rock salt of the Punjáb than salt formed either naturally or artificially by the evaporation of sea water. These deposits appear to have been brought to

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notice first by Lieutenant Burke of the Bombay Engineers, who made a journey overland from Bombay to Karáchi in 1847. A sample was sent for analysis to Dr. Giraud of the Grant Medical College, Bombay, who pronounced it to be "of remarkable purity, absolutely free from bromides, iodides and salts of iron." A few years later certain native speculators obtained permission to start an export trade in the article to Bombay and Calcutta, paying a duty of 12 annas a maund. A company was afterwards formed under the name of the Kurráchee Salt Company, with a capital of Rs. 10,000, to carry on this trade. The export trade went on briskly for a time, but a difficulty occurred between Sind and the Bengal Government about rebate of the import duty levied at Calcutta, and Sind salt, weighted with a double duty, could not compete with the produce of Cheshire; so the company languished and expired. The Bengal Board of Salt and Customs then took up the trade on its own account, but this was stopped by the Government of India. Subsequent efforts by venturesome firms all failed from one cause or another, so this great mine of wealth remains undeveloped.

Salt deposits are very numerous also in the Thar and Párkar District. These differ essentially from the deposits found near the coast, which are formed by the evaporation of sea water. These are lakes, or tanks (*dhand*), fed by springs, or rain water, which, flowing through a saline stratum, become impregnated with salt to the point of saturation, so that, as the water is condensed by evaporation, the salt is deposited at the bottom in a mass which may attain a depth of several feet. It is dug out with pick and shovel and heaped on the bank to dry. In 1878, when the Sind Salt Department was reorganised, excavation was prohibited except at two places, where it continues to be carried on to the present time by Government and supplies nearly the whole of the Thar and Párkar District and some parts of Hyderábád. One of these places is at Sáran, near Diplo, and the other at Dilyar near Khipro. An account of them will be found under Salt Revenue. The remaining deposits are watched by the Preventive Officers of the Salt Department, who in 1905 had on their lists 84 in the Diplo, 33 in the Mithi, 15 in the Nangar and 30 in the Khipro Taluka. Many of these, however, were found to have dried up, or ceased to deposit salt, as often happens owing to

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changes in the flow of the water that feeds them, and more than fifty of them have been, or are now being, allotted for cultivation. Others remain as productive of salt as ever. For twenty years the Sáran deposit has yielded about 15,000 maunds per annum, but it shows no signs of exhaustion.

CHAPTER III.

HISTORY.

History.

ANCIENT HISTORY.

The dawn of history (if it is history) reveals an Aryan dynasty in power in Sind. In the great war celebrated in the Mahábhárat, the date of which has been assigned on astronomical grounds to the 12th or 13th century B. C., Jayadrath, King of Sind, appears as a partisan of the Pándavas against their cousins the Kauravas. His morals do not reflect credit on the Province even at that early date, for he attempted treacherously to abduct the fair Draupadi, wife of the five Pandavas, and was chased by them in ignominy back to his own country. This may be myth, but the essentially Sanskritic character of the Sindhi language, which has withstood so many corrupting influences down to the present time, is strong corroborative evidence of early Aryan supremacy. We have no further light, however, from history after the time of Jayadrath till Skylax explored the Indus in a flotilla equipped near Peshávar and the valley was annexed to the empire of the great King Darius about the year 515 B. C. The details of the adventurous voyage and victorious campaign have been lost and all that transpires, beyond the mere mention of the facts, is the knowledge that the conquered provinces of the Punjáb and Sind were considered to be the richest and most populous satrapy of the empire, to the revenues of which they were required to pay the enormous tribute of fully a million sterling. Nearly two centuries later the veil is lifted by another invader whose historians have fortunately transmitted a welcome, though all too scant, account of the conquered territories and peoples. Alexander the Great, having subdued the greater part of the Punjáb, started with a fleet of nearly two thousand vessels on his voyage down the Jihlam and Indus in October 326 B. C. The frontier of modern Sind must have been reached early in the following year. Mousikanos, whose capital is usually identified with Alor,* surprised by the rapidity of Alexander's movements, submitted: repenting later he revolted on

* The site of Alor, the modern Aron, is 5 miles south-east of Rohri in the Sukkur District. It will be described in the B Volume for that district.

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the advice of "Brachman" counsellors. He was caught and executed and Alexander destroyed the Brahmans, just as Edward III tried to exterminate the Welsh bards who fanned the flame of patriotism. The territories of this chief were the most flourishing of all which the Greeks had seen in India. Sambos, the ruler of Sindimana, possibly the modern Sehwan,* surrendered. Mœris, the ruler of Patalene or Lower Sind, abandoned his capital Patala to the invader. The position of this place has not been determined. All that is known with certainty is that it was situated near what was then the head of the Delta. Four centuries later, in the time of Pliny, it was known to the Romans as an emporium of trade. Having fortified Patala and commenced the construction of a dockyard, Alexander sailed down the western arm of the river to the sea; returning to his base he then explored the eastern branch, near the mouth of which he passed through a lake, the mention of which raises the interesting question whether the Rann of Cutch was then an inland sea formed by the discharge of the Indus and other rivers. In the autumn of 325 Alexander set out from Patala on his long march through Makrán and Persia, his fleet under Nearchos following as soon as the south-west monsoon had subsided. The admiral was detained by gales for three weeks at an anchorage which the Greeks called Alexander's Haven and which was very probably Karáchi Bay. Krokála, the island of Bibakta and other places mentioned by Arrian are not certainly identifiable. The name of the first survives in Kakrála, a term recently applied to a region west of Sháhbander. Alexander's hold on the province was brief; two years after his departure his own career came to an end at Babylon and the Macedonian empire fell to pieces. In the subsequent partition of territory India fell to Seleucus Nicator, who made it over by treaty to Chandragupta (Sandracottus) at Pataliputra, and it continued to owe allegiance to that emperor's successors, Bindusara and Asoka. The immense structure reared and held together by the genius of the first three sovereigns of the Maurya dynasty did not long survive the death of the great Buddhist emperor in or about 231 B. C. For the next century the Greek kings of Bactria claimed sovereignty over Sind and the Punjáb. Regarding the nature and extent of their control there

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* Sehwan, built on an eminence and possessing in olden times a water supply independent of the Indus, is one of the few towns in Sind of which the unbroken continuity with the remote past is attested.

History.

is little of certainty and not much of interest; but their coins are still found in the ruins of old Sind towns and their influence on Indian sculpture is indelible. About a century before the Christian era the Saka, or Scythian, hordes, before whom the Bactrian kingdom had fallen, began to pour into India. This was worse than Persian, Greek, or Bactrian; for the Scythians did not come to conquer, but to possess. Wave followed wave, sweeping away, or swamping, the native inhabitants, until some stern barrier was reached against which they beat in vain. Such a barrier for a time was the kingdom of Ujjein under the great Vikramáditya, from whose victorious resistance to the Scythians the Hindu Samvat era (57 B. C.) is supposed to date. Another Hindu era, the Sáka (78 A. D.), marks more unequivocally the nature of the deliverance (or disaster?) which it commemorates. On the east of Sind the great desert must have constituted a barrier of another sort. Behind it were Rájput races, with whom their kindred, the Sama and Súmra, might find an asylum; but west of it we shall not be far wrong in assuming that Greek and Hindu alike were almost obliterated for a time. Sind become known as Indo-Skythia, and to this day a large proportion of the population is certainly Scythian, not Aryan.*

We shall not lose much by passing over the obscure incidents of the next few centuries and taking a general view of the great movements which brought about the state of things existent at the time of the Arab conquest. In the first place we may note that the Scythians had nothing to offer. They brought to the nations which they overcame no new religion, no higher civilization, no nobler language. On the contrary they ultimately absorbed these

* Two Scythian tribes, the Jats and Meds, are mentioned as having invaded the Punjáb and Sind at this time and their conflicts disturbed the Indus valley for centuries after. The former have not even lost their name, though they may have greatly mixed their blood. The latter seem to have disappeared, but some of the Muhánas of Sind call themselves Med and it is the name of the corresponding community in Makrán. On the other hand Ibn Haukal, the Arabian geographer, who wrote some time between 943 and 968 A. D., describes the Jats as people who lived in morasses formed by the mouths of the Indus, constructed huts of reeds and subsisted on fish and waterfowl. He may have named them wrongly, for he also mentions inland Jats, who lived, like Kurds, on milk, cheese and dorra bread. The whole subject is very obscure and becomes hopelessly so if we admit the story of the Mujmal-ut-Tawáríkh that the Jats and Meds were reconciled and wisely ruled by the wife of the Aryan King Jayadrath abovementioned, which would push back their arrival in Sind by eleven or twelve centuries. It is wisest perhaps to adopt the pious author's conclusion. "God only knows the truth."

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from the people in the midst of whom they settled. Buddhism was the religion of India at the time when their invasions began and by the middle of the first century we find Kanishka, the ruler of a great Scythian kingdom in northwest India, calling a council for the revision of the Buddhist sacred books similar to the famous council of Asoka in 244 B. C. And as Asoka's version was accepted throughtout India, so that of Kanishka became and still is the Buddhist canon in Thibet, Tartary and China. Some time before the Arab conquest of Sind the Brahman revival had set in and in the second quarter of the seventh century, when the Chinese pilgrim Hiuen Tsiang traversed India, he found Brahmanism and Buddhism confronting each other in Málwa, Cutch, Valabhi, Ujjein and Chitor. Some of these states were ruled by Brahmans and some by the Khatris, which we may take to mean Rájpúts. Crossing dangerous deserts and the river Sindhú, he finds a Súdra king in whose capital there were hundreds of convents, but also 30 idol temples. In another capital were 80 convents and 10 temples. On one side of the river he fell in with a sect of fanatics who wore the dress of Buddhist monks, but their only profession was murder and the tending of cattle.

All this throws much light on the situation revealed by the annals of the Arab conquest. A Hindu dynasty had been in power for five generations with Alor for its capital. Its dominions extended from Multan to the sea and from the desert to the hills, including that part of Baluchistan now known as Jhalawán. There were governors at Brahmanabád,* Siwistan (Sehwán), Iskandah (supposed to be Uch) and Multan. The first ruled over the country of the Lohánás, Lakhis and Samás and had the forts of Debal and Nirun.† Jats were everywhere. The king, by name Sahasi II, was a Rajput clearly, for the king of Chitor was a relation of his; but he had a Brahman chamberlain. When he died the Brahman seized his throne, married his widow and exterminated the rest of his family. This happened in 631 A. D., one year before the death of the prophet Muhammad. Chach, the

* The ruins of Brahmanabad, which are described elsewhere, lie 11 miles S. E. of Shahdadpur in N. Lat. 25° 50′ and E. Long. 68° 50′. They are now known as Bámbnáh.

† Nirun was on the site of the Modern Hyderabad, but the Indus flowed east of it at that time: Debal was a port on the Indus, of which the ruins remain. They are 20 miles S. W. of Tatta.

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Brahman usurper, prospered exceedingly, extended his dominions and subdued Armabel (Las Bela) which was ruled by a Buddhist chief. But the new religion the while was spreading like a prairie fire, and before the death of Chach in 671 the Arab soldiers of the crescent had made more than one tentative attack on Sind by sea. Their approach by land had been retarded by the determined resistance of the Jats of Jhalawán. At last, in 711 A. D., when Dáhar, the younger son of Chach, was on the throne of Sind, the storm burst. The provoking cause was an outrage by the pirates of the Sind coast, who seized a vessel bearing slaves and presents for Hajjáj, the governor of Irák, which had been driven ashore near Debal, and killed or imprisoned the Arabs found on board. King Dáhar giving no satisfaction, Hajjáj, with the consent of the Khalif of Baghdád, despatched an expedition under his nephew and son-in-law, Muhammad Kásim, to take vengeance and conquer Sind. The force consisted of 12,000 men, half on horses and half on camels, and the commander was a youth of twenty. Surely there never was a madder enterprise. But in less than a year half of the great Hindu kingdom over which Chach had ruled owned this young Musalman for its master, and the rest soon followed. One reason for his easy success makes itself so plain that we need scarcely look for another. Sind was a house divided against itself. The king was a Brahman, the governors of the forts were generally Buddhists. The important town of Sehwan was held by the king's own son Bajhra, but the principal citizens were Buddhists and would not fight for him. So Muhammad, after delivering the Musalman prisoners at Debal and destroying the place and slaughtering its inhabitants, marched to Sehwán and got possession of it in a week, entered a fort called Sisam without opposition, walked into the open gates of Nirun and then prepared to meet Dáhar. The Arab historian's account of the great battle, which lasted for four days, is rich in those Homeric incidents of which ancient history has been so sadly shorn by modern criticism. At the head of 5,000 horsemen, princes of royal blood, 60 elephants and 20,000 footmen in complete armour, the king himself advanced, seated on a mail-clad elephant and with his bow in his hand. Beside him were two beautiful damsels, one to hand him arrows as fast as he could shoot them, the other to refresh him, as he might require it, with betelnut. But, to be brief, the king was killed and the army scattered and Muhammad marched to Brahmanabad and

Arab Invasion A. D. 711.

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Alor. Then, towards the end of 712, he went on to take Multán. His success was no doubt made easier by the wise military policy of the Arabs and his own prudence and moderation, and also by the reputation which the Arabs had earned of being always true to their word. In a town that refused to capitulate, every fighting man was killed without mercy; but when tribute had once been agreed to, even Hindus were allowed to retain all their rights and privileges, including liberty to practise their religion. Merchants and craftsmen were not molested. Every town therefore clearly understood the alternative before it, and where faction was stronger than patriotism it is not a matter for surprise that so many chose capitulation.

The young conqueror pursued his victorious career for three years, when he was suddenly recalled. The story of his horrible end is too well known to require repetition here, especially as it is probably not true.* All that is certain is that Muhammad Kásim was executed; but the Arab governors of Sind remained.

The Arab governors may be considered in the light of farmers-general. The ordinary revenue which they were entitled to collect was derived from the land-tax, from the *jizya*, or capitation-tax upon those who had not embraced the Mahomedan religion, from customs and transit dues, for which unbelievers had to pay a double rate, and from taxes on trades and handicrafts. The land-tax, as originally instituted by the Khalif Umar, was usually rated at two-fifths of the produce if the fields were watered by public canals, at three-tenths if irrigated by artificial means, and at one-fourth if altogether unirrigated. A charge was also made upon uncultivated arable land. But these rates were purely nominal: in course of time they were everywhere greatly enhanced even to one-half of the produce of the land, or rather according to the ability of the people to pay. All the unconverted tribes were without exception liable to the capitation-tax, which from the earliest days of Arab rule in Sind was exacted with special care.

For the next 35 years the dim light of history reveals nothing of interest. A son of Dáhar, by name Jaisiya, appears on the

* The substance of the story is that he was falsely accused by two daughters of King Dahar, whom he had sent to the Khalifa's harem, and that the Khalifa, believing them, ordered him to be sewed up in a raw cow-hide and despatched to Baghdad, which was done.

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stage making a bid for his father's kingdom, seizes Brahmanabad and accepts the religion of Muhammad that he may be allowed to retain it. But he soon falls foul of the Arab governor on the other side of the river, is defeated and slain. When the Ummayide Khalifas gave place to the Abbaside in A. D. 750, a new set of Governors and placeholders ejected the old, which cannot have signified much to the country or its people. The chief governor, Mansur bin Jamhur, fought for his place, but had to fly to the desert, where he died of thirst. But his name remained in the city Mansura,* founded by him according to the Arab geographer Masudi. Of the governors who succeeded him some extended their authority, some lost what had been gained. The conversion of the people, which was the foremost aim of the early Arab conquerors and by far the most permanent result of their conquests, probably proceeded fitfully, as did the conversion of their subjects to christianity by the Portuguese some centuries later, zeal lighting the fire under one ruler and policy quenching it under another. One great Shekh, by name Abu Turáb, who took the important fortress of Bukkur and did other deeds of valour, claims our interest because his tomb, situated about 2 miles from the village of Gujo in the Mirpur Sákro Taluka and about 10 miles west from Tatta, and bearing the date 171 (A. D. 788), must be the oldest historical record of any kind in Sind. Many Arabs are said to have settled in the country in these days, obtaining land and power, which is likely enough to be true. But they had trouble with the wild heathen. The Jats in the north and the Meds in the south were unruly and vexatious. Branding, deportation and occasional slaughter failed to suppress them. The limits of the Arab occupation are not certain and probably fluctuated; but it appears that from 871 A. D. Sind, with Mansura for its capital, was quite distinct from Multán. About 951 A. D. the geographer Ishtakhri described Mansura as more fertile and also more populous than Multán. He gives us a glimpse of common life in the note that "The people of Multán wear trowsers and most of them speak Persian and Sindhi as in Mansura." The ruler of Mansura kept 80 war elephants. At this time the Hindu town of Alor was a dependency of Mansura. In or about 1026 A. D. Mahmud of Ghazni, no friend of the Khalifa, having taken

Invasion by Mahmud of Ghazni A. D. 1026.

* Mansura was built a few miles from Brahmanabad, probably as a garrison town, or place of defence, against insurgent Sindhians.

History.

Multán, sent his wazir, Abdur-razák, to conquer Sind, of whom it is related that he took Sehwán and Tatta and drove the Arabs out of the country. This evidently means the officials. Arab settlers were not disturbed. On the contrary he appointed new governors from among them. Then he went away. For fifty years after there was little interference from without and of what went on within we have no clear record. But when Shahab-ud-din established the Mahomedan empire in India by making Delhi its capital, about the end of the 12th century Sind became a part of it and did not cease to be so, *de facto* or *de jure*, until the irruption of Tamerlane. Kutb-ud-din, who shortly after succeeded Shahab-ud-din at Delhi, was the officer appointed to conquer Sind, which he is said to have done in three months. There was probably little opposition. Why should the people fight for a nominee of the extinct house of Ghazni against the deputy of the rising house of Ghor? At the death of Shahab-ud-din in 1206 A. D. we find a great man, Názir-ud-din Kabacha, filling the post of viceroy in Multán and Sind, as Kutb-ud-din did in Delhi. They were both Turki slaves, trained and raised to power by Shahab-ud-din, who had no children of his own. When the death of the master made Kutb-ud-din independent at Delhi, Názir-ud-din, who was his son-in-law, acknowledged him as his Sultan; but on the death of Kutb-ud-din in 1210, he considered himself as good as Shams-ud-din Eltamish, who had displaced Kutb-ud-din's incompetent son Aramshah. Eltamish was trying, not very successfully, to enforce his authority, when he was checked by an event that brought that tornado which was then devastating the Mahomedan kingdoms beyond the Indian frontier uncomfortably near to his own throne. The word Mughal or Moghul, has been so much identified in our histories with a brilliant Mahomedan empire and with individual Mahomedan rulers of high culture that we do not easily realise what that word signified when Changez Khan first spread the terror of it through Asia. The poet Amir Khusrao has given us a picture of it which defies historical criticism. "There were more than a thousand Tartar infidels and warriors of other tribes, riding on camels, great commanders in battle, all with steel-like bodies clothed in cotton, with faces like fire, with caps of sheepskin, with their heads shorn. Their eyes were so narrow and piercing that they might have bored holes in a brass vessel. Their stink was more horrible than their colour.

Subjection to Delhi.

THE TARTARS.

Their faces were set on their bodies as if they had no necks. Their cheeks resembled soft leather bottles, full of wrinkles and knots. Their noses extended from cheek to cheek and their mouths from cheek bone to cheek bone. Their nostrils resembled rotten graves and from them the hair descended as far as the lips. Their moustaches were of extravagant length: they had but scanty beards about their chins. Their chests, of a colour half black half white, were so covered with lice that they looked like sesame growing on a bad soil. Their whole body indeed was covered with these insects and their skin was as rough and grainy as shagreen, fit only to be converted into shoes." Such were the men who now poured into the Punjáb on the heels of Jalál-ud-din Khwarism Khan, whose dominions they had destroyed. Failing to get assistance, or even shelter, from the cautious Eltamish, he managed to collect a wild band and ravaged the valley of the Indus and invaded Sind. According to Ferishta the Mughals followed him there and behaved after their manner, killing 10,000 prisoners in cold blood because provisions ran short. Meanwhile Názir-ud-din, shut up in Multán, resisted them so stoutly that they gave up the seige and retired. No sooner had the storm blown over than Eltamish again attacked Nazir-ud-din, whose resources may well have been exhausted by this time. He took refuge in Bukkur first, then tried to escape down the river and was drowned. So Sind came again directly under the throne of Delhi, which during the reign of Eltamish extended, or confirmed, its authority over all the Hindu kingdoms to the east of Sind. A governor was appointed over the province of Sind and Multan. How far he was really answerable to the throne at Delhi for anything depended upon the character for the time being of its occupant and on his own. How he governed his people we can only conjecture. The historians of that time do not concern themselves much with the people, and indeed the rulers, from the emperor downwards, were so continually occupied with resisting invasion from without, or suppressing insurrections and intrigues within their dominions, that they can have had but little time to spare for administration. In Sind the governor was always a foreigner and his troops probably mercenaries. The death of Eltamish in 1236 was followed at Delhi by "a succession of plots, mutinies and revolutions equally destitute of present interest and permanent effects." This need not have disturbed

History.

A. D. 1225.

History. the peace of Sind, but in 1245 the Mughals again invaded the Province and got as far as Uch, when the emperor Masud Shah advanced against them and caused them to retire. He took the opportunity to visit Bukkur, dismissed the governor Nur-ud-din, whom Eltamish had appointed, and put in Jalal-ud-din. So the Majesty of Religion succeeded the Light of Religion and, knowing that his time also might be short, made the most of it no doubt. Again in 1249 there was a royal visit. Sultan Nazir-ud-din made a progress through Multán and Sind and went as far as Sehwán and appointed Kalich Khan to be governor of that place. This seems to indicate a separation of Sind from Multán and undoubtedly there was something of the kind. The incessant ravages of the Mughal hordes, which were now practically in possession of all the country west of the Indus, made it necessary to put the Punjáb frontier, from Uch, or perhaps Bukkur, northwards, under a strong "Warden of the Marches" and to relieve him of the comparatively quiet, southern portion of the province. This led the way to the ultimate independence of Sind. The emperor Ghayas-ud-din, who succeeded to the throne in 1265, committed the frontier province to his brave, accomplished and pious son Muhammad, "the idol of the age." This prince's governorship of Multán has some interest for us, for among the men of piety and learning whom he invited to his court was Shekh Usman Marwandi, popularly known as Lal Shahbáz Kalandari, whose tomb at Sehwán is still the most venerated shrine in Sind. He was one of the many learned Sayads who were driven by the devastation of Khorassan and Persia to take refuge in the Punjáb and Sind, where they continued for a long time to exercise a widespread influence in favour of religion and scholarship among those of their own faith, and probably did much to extend it. Lal Shahbáz accepted Muhammad's invitation to Multán and was royally entertained, but refused to stay. In 1284 a large Mughal army under Timur, or Taimur Khan, invading the Punjáb, was defeated by Muhammad, but he himself was killed in the
A. D. 1228. hour of victory. When Jalál-ud-din Feroz, the first of the House of Khilji, came to the throne of Delhi, he continued the existing arrangement, putting Multán and Uch under his own son Arkali Khan, but appointing a governor, Nasrat Khan, over Sind, with his head-quarters presumably at Sehwán. But when Jalál-ud-din was assassinated and succeeded by his

nephew Ala-ud-din, the first place to which the usurper turned his attention was naturally Multán. It says little for the ability of Arkali Khan that Ala-ud-din allowed him to go with his life; but in Nasrat Khan, governor of Sind, he found a fit agent to send, with an army of 10,000 men, through the districts of Multán, Uch, Bukkur, Sehwán and Tatta to "put down adverse tribes and appoint trustworthy men as governors of the several towns and forts." (Tarikh Maásumi.) The mention of Tatta, so long unheard of, is quite in harmony with the change which came over the whole administration of the country under this able and vigorous ruffian, hampered by no scruples and acting always on his own maxim that "the will of a wise prince is better than the opinions of variable bodies of men." Every corner of the empire was looked into, Gujerat was re-conquered and Jesalmir subdued, while the fall of Chitor brought even the proud Rajputs "under the yoke of obedience." All this must have made the suzerainty of Delhi much more real in the south of Sind than it had been for a very long time. It was evidently real enough to be irksome, for when the house of Khilji fell and Gházi Malak, the strong governor of Multán, left the province to become emperor under the title of Ghayas-ud-din, the tribe of Sumras, occupying the country about Tatta, took the opportunity to declare their independence. The Sind historian, Ali Sher of Tatta, ascribes the origin of this tribe to certain Arab families from Samrah who had settled in Sind in the days of the Abbaside Khalifas. The only connection between them and the Arabs appears to be that the Arabs thoroughly imbued them with their Semitic passion for genealogies, as they did their disciples generally. Every Sindhi tribe converted to Mahomedanism began presently, like the rich American, to look about for ancestors; and where should they look but in the country of the prophet of their new religion? It is generally agreed that the Sumras were a Rajput tribe and the names of their first rulers, Sumra, Doda, Sanghar, Bhangar, betray their extraction. When they were converted to Mahomedanism is not known, but there is reason to believe that before doing so they came for a time under the influence of the Karmatian heresy. Nor is it clear when they rose into power. The accounts of the native historians are quite irreconcilable and there is little agreement in the conclusions to which European authorities have come. Elphinstone says, "Kasim's

Rule of the Sumras.

Circum A. D. 1321.

History.

conquests were made over to his successor Tamim, in the hands of whose family they remained for thirty-six years, till the downfall of the Ummayides, when, by some insurrection of which we do not know the particulars, they were expelled by the Rajputs and all their Indian conquests were restored to the Hindus." And again he writes, "After the expulsion of the Arabs in 750 Sind, from Bukkur to the sea, was ruled by the Sumra Rajputs till the end of the 12th century." On this Elliot pertinently remarks, "Here the whole period of the Abbaside governors and of the independent rulers of Multáu and Mansura and the Karmatians, is entirely neglected. So important an omission by such a writer teaches us how obscure are the annals with which we have to deal." There is indeed abundance of incidental evidence that the Musalman rulers recognised and confirmed local Hindu chiefs. The famous Raja Dalurai, whose iniquities brought down heaven's judgment on Alor and Bráhmanabád, cannot be wholly mythical, though the variety of places and ages in which he reigned is perplexing; and in 1221 A. D. we have casual mention of a ruler named Hasrar and Hindu temples in Debal.* Similarly in the middle of the 18th century we find virtually independent rulers in Kakrála and Dharaja. But there is no evidence that, from the time when Mahmud of Ghazni expelled the Khalifa's governors and put in his own, the suzerainty of the ruler of Ghazni first and then of Delhi, over the whole of Sind, was ever repudiated until the time at which we have now arrived. That may have been because it was not worth repudiating, for when Multán was the head-quarters of the governor and the centre of all military and political interest, it is easy to believe that the south and east of Sind were virtually independent. At some time during that period the Sumras had become the dominant tribe and it is related by Ali Sher that, soon after the accession of Ghayas-ud-din, they assembled near Tharri and proclaimed a man with the tribal name of Sumra as their chief. But Ali Sher himself contradicts this in another place by saying that they were deservedly destroyed for their misdeeds by the emperor Ala-ud-din (who preceded Ghayas-ud-din). Mir Maásum agrees with the former story, *viz.*, that the Sumras revolted about the time of Ghayas-ud-din and took possession of Tatta. Ghayas-ud-din had no time to attend

*The Jahan Kusha and Jami-ut-tawarikh, quoted in Elliot's History of India, Vol. I, p. 490.

History.

to them, but his son and successor, the renowned scholar, brilliant soldier and madman, Muhammad Shah, came to Lower Sind in 1351 in pursuit of the ringleader of a revolt in Gujerat who had found an asylum with the Sumra rulers of Tatta. As is well known, he died near Tatta, and his nephew Feroz Taghlak, who succeeded, appears to have met with no serious opposition except from a mixed band of followers of the rebel, whom he scattered. He built a fort on the banks of the Lake of Sangrah, visited the shrine of Lal Shahbáz, fixed the allowances of the keepers, appointed a viceroy at Bukkur, giving him a garrison of 80 soldiers, and left for Delhi. But this was the last flicker of the expiring power of Delhi in Sind. The next time Feroz came to Tatta the Sumras had been superseded by the Sammas and he did not find them so submissive. They were another Rajput race, albeit they also had provided themselves with a Mahomedan genealogy, nay several; for while all agree that the *fons et origo* of the Samma tribe was one Sam, there is with respect to Sam himself much uncertainty as to whether he was the son of an uncle of the prophet, or of the renowned Jám, *alias* Jamshed, of Persia, or whether he was neither of these but identical with him whom we know as Shem the son of Noah. The time of their conversion is not known, but it seems probable that they may for a long time have entertained a blend of both religions, like the Jádejas of Cutch, who are of the same race and of whom the Rao himself once averred that, out of two thousand Jádejas there are not three who know what their religion is. When the Sammas got into power their rulers took the title of Jám, now borne by the Jádeja chiefs of Cutch, and it is significant that, while the first ruler is called Unar, the second Juna and the third Tamáchi, the fourth, who had been carried captive to Delhi in his infancy, emerged as Khair-ud-din. After that the royal blood ran through a line of Salah-ud-dins, Nizam-ud-dins and so forth, relieved by a second Jám Tamáchi, whose rustic name has lived among his rustic people when the Ud-dins have all been forgotten. Sindhis still sing how this King Cophetua loved the fisher maid and raised her to his throne, and they point to the tombs on the Makli hills where they lie side by side. It is interesting to note that the springs which fed the streams of popular song were not in the provinces ruled by the foreign governors with whom alone the historians concern themselves, but in the south and east where the Sumra and the

Rise of the Sammas.
Circum A. D. 1351.

History. Samma, though they might profess themselves Musalmans, were Rajputs still at heart. But they were romancers, not historians, and the annals of their times are very misty. That the Sammas unseated the Sumras about the time of the death of Muhammad Shah is clear enough, and they extended their power much more rapidly than the Sumras had done, for they were a larger and more widely spread tribe. At the present day there are 730,000 Sammas in Sind against about 100,000 Sumras. They took possession of Sehwán and even had the audacity to expel the royal garrison of 80 from Bukkur. Then (1372 A. D.) the Sultan came in person to chastise them. The chastisement did not take place, however, for the Jám shut himself up, and the imperial army, investing him, was famished and surrounded by the inundation waters and devoured by mosquitoes. So when the Jám offered to profess submission, the emperor was fain to accept the offer. For the next 26 years the profession may have remained, for it was not worth repudiating; then the Amir

A. D. 1398. Taimur, known to us as Tamerlane, led his Tartar hordes over the frontier and past Multán and on to Delhi itself. For five days the imperial city was given up to indescribable horrors and what remained of it had no further concern for Sind. The Sammas became nominal as well as actual lords of the province. Their rule in its palmiest days is said by the Tatta historian to have extended from the sea to Máthelo and Ubáuro, and since they held the fortress of Bukkur, but not Uch, this is probably near the truth. Their headquarters were at Samui, on the Makli hills, about three miles northwest of Tatta, (which was not yet built, though the historians often use the name) and there were governors at Sehwán and Bukkur. Loyalty to one another was evidently not one of their virtues and each succession was an occasion for intrigues and assassinations. During the period of their supremacy, which, on what appears to be the soundest chronology, lasted from 1351 to 1521 A. D., or 170 years, there were, according to the Tarikh Maásumi (though other authorities disagree) 17 Jáms. It was evidently not healthy to be a Jám. Among them there was occasionally a good and strong ruler, under whom the people enjoyed "ease of mind." Of such was the handsome Jám Sanjar, who sought the society of the learned and the pious. In his days there was a *Kázi* of Bukkur who was in the habit of exacting something from both

parties to every suit in his court. When Jám Sanjar heard of this, he sent for the *Kázi* and taxed him. The honest *Kázi* admitted it. "Yes," said he, "I do demand something from the plaintiffs as well as the defendants and I should like to get something from the witnesses too, but they go away before the case closes." Jám Sanjar could not help laughing, whereupon the *Kázi* continued, "I work in the court the whole day and my wife and children die of hunger at home." The wise Jám laid these words to heart and at once raised the pay of the *Kázi* and issued an ordinance that all government officers throughout his realm should be paid adequate salaries. Jám Sanjar was succeeded by a man of like mind, "fond of literature and an industrious person, regular in his prayers and very religious." This was Jám Nizam-ud-din, affectionately nicknamed Jám Nindo. In his days mosques were always full at the time of prayers. He was a man of action, however, as well as prayer, and extirpated the robbers who used to frequent the country about Bukkur, so that travellers could thenceforth traverse Sind "without any one doing harm to their person or property." These robbers may have been the restless Baluch tribes of whom we hear a good deal from this time. Having settled his realm, Jám Nindo resolved to build, on some auspicious day, a new town, where happiness might remain for ever. He chose the site and the Brahmans the day and the city of Tatta was founded.* Happily for Sind Jám Nindo's reign lasted for about 50 years (some say 63 and some 73). The close of it was marked by one event of evil omen. Shahbeg Arghun, a descendant of Halaku, the grandson of Changez Khan and himself ruler of Kandahar, foreseeing that the growing power of Bábar would surely swallow him up where he was, looked about for a new kingdom and determined to try Sind. He sent a small force under his brother into the unhappily fertile *parganah* of Chanduka. The Samma army, under Darya Khan, discomfitted it so completely that the Kandaharis never returned in the good Jám's days. But the good Jám's days were nearly done. He "raised on high the banner of his departure to the eternal world" and left his throne to his son Feroz, who was then a child in the zenana. When he came out of the zenana he gave himself up to the songs and dances of dancing girls and the jokes of jesters. His people the while were groaning under the

History.

FOUNDING OF TATTA.

* This pleasant story rests on the authority of the Tuhfat-ul-kiram.

History.

oppression of his Samma officers and their slaves. A bad conscience making him suspicious of his own and his father's true friend Darya Khan, who alone had propped him up in his place, he thought to be politic and encouraged sundry Mughals, subjects of Shahbeg Arghun, to take service with him, and settled them in the part of Tatta which has become the Mughalwarra. They liked the place seemingly and suggested to their former master that he might have it for the taking. By this time he had relinquished Kandahar to Bábar and was in very low water. So he made his preparations and marched into Sind, apparently in 1521, and took a straight course for Tatta through the Laki pass, avoiding a Samma force which had advanced to meet him. At that time the Gháro outlet of the Indus seems to have left the main river north of Tatta and it stood in the way of Shahbeg's army; but they found the ford and gave battle to the forces of Jám Feroz between the river and the town. The Sammas were defeated and Darya Khan, their brave leader, killed. Jám Feroz, who had remained in Tatta, fled and left it to be sacked till some Sayads interceded with Shahbeg. Afterwards the miserable Jám returned with a sword dangling from his neck as a sign of submission, and was kindly received by the generous Shah and even left in possession of a part of his dominions, Shahbeg considering that, if he had the country north of the Laki pass, it was as much as he could manage. The fallen Jám's subjects did not approve of this and Shahbeg had to fight for Sehwán, but he soon possessed himself of it and then settled down in earnest to make the most of his new dominions. He restored the fortifications of Sehwán and put Bukkur into thorough repair with materials from the ruins of Alor, and did something which caused the Sayads to clear out of it and repair to Rohri, where he graciously gave them land. He turned his attention to the Baluch tribes, who had become intolerable, and appointed a day for a general slaughter of them. It is said that 42 of their villages were destroyed. Shahbeg was not satisfied, however, with Sind and set his heart on conquering Gujerat, with the idea, perhaps, of putting a greater distance between himself and Bábar; but when he was making preparations for this enterprise, he died after a reign of fifteen years. The place of his death is variously stated, but his body was carried to Mecca. The reign of Mirza Shah Husein, who succeeded his father Shahbeg, brings us to

Rule of the Arghuns A. D. 1521 to 1554.

History.

one of the most interesting periods of Sind History. He had quarrelled with his father while still at Kandahar, and betaken himself to the count of Bábar. That shrewd and genial conqueror observed that he had not come to him because he loved him, but because he wished to learn the art of government and the etiquette of courts; but he treated Mirza well and so impressed him that, when he came to the throne of Sind, he refused to let the *khutba* be read in his own name, declaring that, as long as there was a descendant left to the emperor Taimur, it was his right only. The first event of Mirza's reign was a conflict with Feroz which ended the rule of the Sammas. The death of Shahbeg appears to have kindled in the mind of Feroz some vain ambitions, to which he gave expression by the beating of drums and such like unbecoming jubilations. Mirza marched straight for Tatta and Feroz fled to Cutch, where he obtained help of the Rao and returned with 50,000 men. They must have been a rabble of Sammas, Samejas and Jádejas. At the sight of the Mirza's Mughals they resorted to a custom common to all the Rajput tribes when driven to despair. Dismounting, they took off their turbans and scarves and tied themselves together and prepared to conquer or die in a body. They did not conquer, but 20,000 of them died, according to the historian, and Feroz fled to hide his diminished head in Gujerat. After this Mirza was much occupied in the hopeless task of trying to enforce order among the Baluchis, Dahars and Machhis of Máthelo and Ubáuro, which led the way to a northward advance and eventually to the conquest of Multán. This city Mirza respectfully presented to Bábar, now Emperor of Delhi, who accepted it and gave it to his son Kamran. Next Mirza invaded Cutch to anticipate a projected attack on Tatta and returned laden with booty. But the event which gives interest to this reign is the sojourn in Sind of the Emperor Humayun, who after the destruction of his army near Kanuj by Sher Khan, in May 1540, took refuge with his brother at Lahore, but distrusting his security there, determined to try Sind. The situation was peculiar, demanding nice diplomacy. Humayun was by right the Emperor of Hindustan and Mirza Shah Husein had voluntarily, if indirectly, acknowledged his supremacy. But Humayun was an almost friendless fugitive and the Mirza was a powerful potentate. Humayun opened with a gracious letter to Mirza, reminding him of the friendship of his father, and sent it

The Emperor Humayun in Sind A. D. 1540-41.

History.

by messengers of rank. Mirza received them with great honour, offered to assist the emperor with an army if he would invade Gujerat and promised to come in person to pay his respects. Humayun waited for him at Rohri, but he did not come. Sultan Mahmud, the wily governor of Bukkur, shut himself up in his fortress and was very respectful, having taken the precaution to remove all boats from the Rohri side of the river and to waste the country far and wide that the two lakhs of people who accompanied Humayun might not have any inducement to stay. After five months Humayun grew weary of the situation and started for Sehwán with the intention of seizing that town. But Mirza's men had anticipated him. He found the fort prepared for a seige and the country around desolated. Mirza himself was entrenched close by. For seven months Humayun beseiged Sehwán in vain: he had no proper engines of war. For the same reason several attempts to take Bukkur failed. He was in despair and meditated a pilgrimage to Mecca. But a timely letter from Rája Maldeo of Jodhpur offered a secular prospect which he preferred. The Raja invited his Imperial Majesty to his capital and was at his service with 20,000 men. Delighted beyond measure, Humayun left for Jodhpur *via* Uch, but on reaching Bikanir he learned that the Rája was carrying out a plot to entrap him on behalf of his triumphant enemy Sher Khan. He turned sharp and, fighting his way for the very right to drink water, passed to Jesalmir and thence, through the desert, to Umarkot. It was a terrible experience of privation and humiliation. His companions died of thirst, his nobles, miserable and desperate, lost the habit of respect and, from their saddles, looked at him going afoot that his wife, the mother-to-be of the Emperor Akbar, might ride his horse. But there was joy in store for him when at length he reached Umarkot with only seven attendants. The Rána Wair Sal (written also Bair Sal and even Dair Sal: Wairsa was the name of a Soda clan), ruler of that frontier fort, came out to meet him, kissed his stirrup and cleared the castle for his accommodation. And so it came to pass that on the 14th of October, 1542, the future Emperor Akbar was born in Sind. The place of his birth is unmarked unless by a stone of uncertain origin which now stands behind the Police Lines in the fort and records the date of the great event. It was the custom on the birth of a son for the

father to send gifts to his friends. Humayun was destitute and in a desert, but he had about him one pod of musk: he broke it and divided it among his attendants with the prophetic prayer that the fame of the newborn infant might diffuse itself through the world like the fragrance of that perfume. To improve his chances the baby's first garment was cut out of the clothes of a holy Sayad, Ali Shirázi,* who had been the bearer of gifts and greetings to the emperor from the people of Tatta. But Umarkot was no place for an emperor even when fallen from his high estate, and Humayun soon moved to a town in Sind called Jun, or Junpur, renowned for rivulets and gardens and pleasant scenes, which was situated on a river. No such garden of Eden can be found now, though there is a *deh* Jun in the Guni Taluka. As he had no means of getting supplies except taking them, conflicts were frequent between his men and those of Mirza Shah Husein. At length a peacemaker arrived in the person of Bairam Khan, a faithful adherent of Bábar and afterwards regent for Akbar, and the Mirza, nothing loth to help Humayun out of Sind, consented to give him 300 horses and 300 camels and 1,00,000 *miskals* (small gold coins). He even built a bridge for him to cross the river, which Humayun facetiously named *Sirat Mistakim*, (a strong bridge), thus recording chronographically the date, A. H. 950 (A. D. 1543-44), and crossing over it, passed into Kandahar.

The Tarkháns A. D. 1554 to 1591-92.

The once vigorous Mirza was now getting senile and paralytic and falling under the influence of baseborn sycophants, which alienated his proud Arghuns, who at length resolved that he must be deposed and another ruler appointed. As every Arghun of position suggested himself for the vacancy, it was decided to select a Tarkhán. The Tarkháns were an ancient and powerful family in Khorassan and Turkestan, the Arghuns being a branch of it. Some of them had come to Sind with Shahbeg and among these one Mirza Isa Tarkhán was universally recognised as a man "wise, prudent and of noble descent." He was accordingly elected to be their ruler. This happened at Tatta, Shah Husein being at Bukkur. He hurried down as fast as a paralytic man might and the rival forces had met near Tatta when Shah Husein's time came to die. The commander of his army was

* This much venerated Sayad died 30 years later and was buried on the Makli Hill. His tomb is still in good preservation.

History.

Sultan Mahmud, the same who had held Humayun at bay so resolutely at Bukkur. He was renowned, they say, for liberality and unequalled courage, and he was also wise. Reflecting that Husein had no son to succeed him, he concealed his condition from the people and arranged a dramatic penitence and forgiveness between him and the rebel: he also arranged secretly that, when the king died—not a day sooner, for he was staunchly loyal—himself and the rebel should divide Sind. Mirza Shah Husein died soon after and so the Arghun dynasty came to an end. Upon the whole Sind appears to have been well ruled and comparatively free from internal dissension in their time. All Shah Beg's acts reveal him as a brave, able and generous man. He invaded Sind from no lust of conquest, but because he was driven from his own kingdom and had to find another, as the manner of his time was, being by birth and profession a king. Having secured one, he set himself earnestly to improve it. He was a scholar and a poet and the author of several religious books and commentaries. His son was like him, singularly free from disquieting ambitions. He took Multán, but gave it away, and his successes in Cutch did not tempt him to extend his dominions. He was a brave and successful soldier, but by choice a scholar rather. The greatest calamity that overtook Sind in his time was the visit of Humayun, when the people suffered terribly from famine brought about by the defensive desolation of the country.

Sack of Tatta by the Portuguese, 1555 A. D.

Unfortunately the agreement between Sultan Mahmud and Mirza Isa Tarkhán did not last and Sind was wasted by fruitless hostilities. It was when the Mirza was absent attacking Bukkur that the famous sack of Tatta by the Portuguese occurred. It appears that the Mirza had sent ambassadors to the Portuguese governor at Bassein representing himself as the King of Sind and asking for assistance against a tyrant who was oppressing him. The governor thought he saw an opportunity of forming a useful alliance and sent a fleet of 28 ships with 700 men under Pedro Baretto Rolim. Arriving at Tatta, Pedro waited for some time while the son of Mirza Isa communicated with his father. When the reply came that Mirza had made peace with his enemy and had no further need of the Portuguese, and when he refused to reimburse the Portuguese for the cost of the expedition, Pedro flew into a rage, killed 800 people, sacked and burned the town, destroying property worth two millions of gold, and went off

with such loot as had rarely been taken in Asia. This is a Portuguese version of the affair. Mir Maásum merely says that, not finding the ruler at Tatta, they plundered the town, took some prisoners and set fire to the buildings near the bank of the river. But the Tuhfat-ul-kiram admits that Mirza Isa had to repair the town and fortifications. **History.**

Mirza Isa died, after a reign of 18 years, in 1572 and was buried on the Makli hill. His sons had quarrelled and fought each other during his life, and at his death the worst of them, Muhammad Báki, succeeded him against his own expressed wish. The historians have no language to describe the greed and cruelty of this wretch. Slitting ears and noses, cutting off the breasts of women, hanging, beheading and trampling under the feet of elephants were the ordinary escape pipes of his rage and jealousy, to say nothing of shaving off the beards of gentlemen of position. Even Sayads were not spared. Travellers were put to death on principle lest they might tempt the cupidity of conquerors by their tales. He sent his daughter to the Emperor Akbar, with a splendid dowry, but she was returned, which blackened his face for ever. Muhammed Báki eventually committed suicide in 1584 and was buried on the Makli hill and the accession of his son Mirza Jáni Beg brought relief to Tatta. During his reign Sind again became part of the Delhi empire. The process was gradual. Akbar quietly assumed that Sind was a dependency and Sultan Mahmud of Bukkur as quietly admitted the assumption and so retained his place and power, besides having the great honour of getting his daughter admitted to the imperial harem and obtaining a title and a khilat befitting a king, a jewelled sword, a caparisoned horse and four elephants. After his death Akbar sent a governor to take charge of Bukkur. Mirza Jáni Beg on the contrary fought for his independence and fought well. Entrenching behind a channel of the river (the Phito) which has long since dried up, he withstood the imperial forces for a good while. Then he formed and carried out the desperate resolution of destroying Tatta and retiring to the strong fort of Kalán Kot a few miles south of it, but he had to sue for peace at last and to go to the emperor's camp and kiss his foot. He was graciously received and confirmed as governor of Tatta. He died a few years after (in 1599) and was buried on the Makli hill. His son, Mirza Ghazi Beg, was confirmed in his place and afterwards had Sehwán,

Resumption of Sind by Akbar, *cir.* A. D. 1592.

Destruction of Tatta A. D. 1591.

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part of Multán and Kandahar added to his charge. But this had the effect of making Khushro Khan, his deputy at Tatta, practically independent, and he abused his opportunity. The officer sent to call him to account bore the hybrid title of Hindu Khan and one Rana Manikchand appears co-operating with him at Nasarpur. Religion was evidently very mixed in South Sind at this time. Many of the Tarkháns indeed were related by marriage with the Sameja Rajputs. On the other hand it was considered a distinction that Mirza Ghazi Beg was able to persuade one Jám Daud to give him his daughter in marriage, for the Jáms generally had refused to intermarry with Tarkháns. Mirza Ghazi Beg was murdered in 1612 A. D. and buried in the same mausoleum as his father on the Makli hill. He was a man of learning and a poet, like his father, and both were such accomplished musicians that it became the custom among pilgrims to their tombs in quest of offspring to charm down their blessing with songs and instruments. But Ghazi Beg's devotion to the muses brought no offspring to himself and the rule of the Tarkháns ended with him. Khushro Khan, the malversating deputy, had got into power again and is worth a passing notice because he is said to have enriched Tatta with 360 mosques, wells, bridges and other public works, at immense cost, as an atonement for having accidentally seen a neighbour's wife at her bath. The emperor Jehangir ignored him, however, and appointed governors of his own choosing under the title of Subahdars, which became the sirname Sobdar in Sind. The Tuhfatul-kiram enumerates 40 of these who held office in succession during the 127 years that intervened between the death of Mirza Ghazi Beg and the annexation of Sind by Nadir Shah in 1739. It was during this period, in 1625, that Shah Jehan, having revolted against his father, the Emperor Jehangir, took refuge for a time at Tatta, the Governor being unable to repel him. Shah Jehan, when he became Emperor, ordered the maginficent Jamá Masjid to to built, tradition says, as a token of his gratitude to the city that had been his asylum in adversity. Some of the imperial governors died at Tatta and their tombs are among the most notable of those on the Makli hill. Many of these governors were mere farmers of revenue: the last three indeed were lessees of a noble to whom the Subah had been granted as a reward. Local chiefs such as the Rajah of Dharaja and the Jám of Kakrála were evidently the

End of the Tarkháns A. D. 1612.

Imperial Governors A. D. 1612 to 1739.

actual rulers of the country, but of them we only get an incidental glimpse occasionally. Upper Sind was under governors of the same character, one apparently at Sehwan and one at Bukkur, and it was during this period that the Daudpotras, or sons of Daud, the family to which the present ruler of Bahawalpur belongs and the founders of Shikarpur, came into power there. They trace their descent from the Abbaside Khalifas through one Amir Ahmad, who came to Sind *via* Makran and set up a kingdom. Both he and his son married daughters of the Hindu kings of Tatta and at first ruled in that quarter, extending their power as far as Parkar, but were afterwards driven across the Indus by the Hindu king of Brahmanabad and settled near Sehwán, where one of the line, by name Jám Chini, obtained from Akbar a *Jagir* and the post of revenue collector for Sind and rose to great power. Later on the head of the family, tired with contending against a rebellious nephew named Kalhora (the progenitor of the Kalhora rulers of Sind) retired further north and devoted himself to an agricultural life, which his children followed. By another account they were weavers. His great-great-grandson, by name Daud, lived to the age of 200, so it is not wonderful that his posterity, who must have known him down to the sixth or seventh generation, got into the habit of calling themselves sons of Daud. So far dates have been wanting, but we get an approximate one when Bahadar Khan, eighth in degree from Daud, makes himself pleasant to the governor of Bukkur under the Emperor Alamgir (Aurungzebe) and obtains an estate rent free between the towns of Lakhi and Khanpur. At this place there was in those days a very notable forest and Bahadar Khan was exceedingly addicted to sport, and so it came about that he came into conflict with Sher Khan, the chief of a colony of Mahars from Ubáuro who had possessed themselves of Lakhi and become powerful Zamindars in that part of the country. A bloody battle ensued in which the Daudpotras smote the Mahars and chased them to the very walls of Lakhi, which they plundered to their great enrichment. Then, to celebrate their victory and by the guidance of a holy man through whose blessing they had gained it, they cleared the jungle which had been the bone of contention and built a town to which they gave the appropriate name of Shikarpur. The date of the founding of the town destined to become so great is revealed by the word *Ghok* (a frog) engraved

The Daudpotras.

Founding of Shikarpur A. D. 1617.

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on the mosque of Haji Fakir Ulla outside the Lakhi gate of the town, the numerical value of which is 1026, corresponding to 1617 A. D. After this the fortunes of the Daudpotras went up and down alternately. The next governor of Bukkur, Bakhtáwar Khan, took a spite at them and they were compelled to take refuge in Multán; but doing good service at a crisis to Moiz-ud-din, grandson of Aurungzebe, they gained favour and got permission to attack Bukkur, which they did and killed the imperial governor. So they regained possession of Shikárpur, but again their success aroused jealousy and they were involved in fresh conflicts. This time their bitterest and most dangerous enemy was Nur Muhammad, son of Khuda Yar Khan, the first of the rising Kalhoras who had been acknowledged at Delhi. Khuda Yar Khan had been appointed governor of Siwi and his son, succeeding him, determined to turn the Daudpotras out of Shikarpur, which they held under a *sanad* from the Emperor's son. Again they fled to Multán and were consoled with a *jagir* in the taluka of Chodri, where they had constant conflicts with the Rawal of Jesalmir, who was instigated by the same Nur Muhammad. But we must stop here. The only interest of these incidents lies in the light which they throw on the condition of Upper Sind under the governors appointed from Delhi, whose duty appears to have begun and ended, as far as the emperor cared, with the remittance of revenue. Every local chief was at liberty to carry on war with his neighbours and any one who could raise a following and seize a fort, or town, might retain it. The invasion of Nadir Shah opens another chapter in the history of Sind, but we must go back a little to trace the rise of the Kalhoras.

RISE OF THE KALHORAS.

The Kalhoras were, as we have seen, a branch of the Daudpotras. They incline to a different version of the origin of the family, finding in their common title Abbassi clear proof of their descent from Abbas, the uncle of the Prophet, through a famous saint who came to Sind instead of the secular Ahmad above mentioned. One story is no doubt just as true as the other. What we can feel fairly assured of is that there was a family, or tribe, claiming halfcaste Arab descent, restless and pugnacious, which had established itself over a considerable extent of country on the right bank of the Indus and began to assert its power when the strong rule of the

Arghuns and Tarkháns gave place to the nominal authority of the everchanging governors holding office from the emperors of Delhi, and that, while the members of one branch, known as Daudpotras, were farmers and weavers, another branch, with the sirname Kalhora, acquired a reputation for sanctity, indicated by the title *Mián*, and strengthened secular with spiritual authority. The first individual of it who stands clearly out of the mist is Adam Shah, a "fanatic disturber of the peace," who drank the sherbet of martyrdom at Multan, probably about the middle of the 16th century, and whose body was brought to Sukkur and buried on a hill by the highroad to Shikarpur, where his tomb is a conspicuous object still. For four generations his descendants lived about Lárkána, multiplying their disciples, acquiring land, increasing their influence and fighting. His grandson Shahal Muhammad was a great agriculturist and dug the original Lárkána canal; but he met a violent death and has a martyr's tomb near the village of Fatehpur. Mián Din Muhammad, the fifth wearer of the prophetic turban after Adam Shah, fought the Panwhars who were in great force about Lárkána at that time, and the Daudpotras and even the imperial governor and, in short, became so intolerable that the prince Moiz-ud-din marched down with a force to chastise him, and though his followers under his fierce brother Yar Muhammad Khan fought the prince, he was carried away a prisoner and never returned. Yar Muhammad took refuge in Kalat for two years, when he returned with a band of Baluchi allies and began a fresh career. Entering Sind near the Manchhar Lake, he defeated the Panwhars and took Lárkána and other towns. This brought the prince Moiz-ud-din down again, but with a wonderful result. What artifices the Mián employed to avert the prince's wrath, or whether he really hastened to Delhi, as some historians assert, and gained the ear of the Emperor himself, no one can now decide. What happened was that, not very long after, he was formally installed as governor of Siwi (Sibi, which then included Shikarpur) with the title Khuda-Yar-Khan. He died about 1718 and his splendid mausoleum among the ruins of his own town Khudabad still testifies to the place which he had gained for himself in the eyes of his generation and in his own, for he built the tomb himself. He was succeeded by his son Mián Nur Muhammad the persecutor of the Daudpotras. This man had by one means or another extended his authority over a large part of Sind,

First Kalhora Governor A.D. 1701.

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Invasion by Nadir Shah A. D. 1739.

including Tatta and Sukkur, when he had to yield to a stronger.

The invasion of Hindustan and sack of Delhi by the great Persian Nadir Shah took place in March 1739. He remained only 58 days at the capital, during which a treaty was concluded with the Emperor Muhammad Shah ceding to him the whole of the territory west of the Indus. On his return march the politic chief of the Daudpotras, Sádik Muhammad, hastened to make submission; but Nur Muhammad was disdainful, or distrustful, and, retreating to Umarkot, defied Nadir Shah from beyond his frontier. Nadir Shah marched down the Indus and was at the gates of Umarkot one morning before Nur Muhammad expected him. So the proud Mian had to accompany him as a prisoner to Lárkána, where he made atonement with a crore of rupees and a promise of tribute and was restored to the government of Tatta; but Shikarpur was given to the hated Daudpotras and Siwi to an Afghan chief. Two of Nur Muhammad's sons were moreover taken away as hostages, but he was consoled with the personal title of Shah Kuli Khan. Nadir Shah left Lárkána for Kandahar and, according to tradition, halted on his way at Shikarpur, where his camping ground is shown.

FINAL EXPULSION OF THE DAUDPOTRAS.

The Daudpotras now returned to Shikarpur and spread themselves out, founding many new villages with the names of their chiefs, Balawal Khan, Ali Murad Khan and others. But Nadir Shah had left an agent of his own named Shekh Sádik in charge of Bukkur, perhaps as a spy, and it was not long before some Daudpotras murdered the Shekh; then an army under Tamasp, one of Nadir Shah's generals, appeared before Shikarpur. There is reason to think that this occurred just about the time at which Nadir Shah was murdered and Ahmad Shah, the chief of the Abdali, or Durani, Afghans, made himself independent at Kandahar. Many events are crowded into a short time here and the accounts of them given by a Daudpotra partisan on the one hand and a Kalhora subject on the other are irreconcilable. The issue of them, as far as Sind is concerned, was that the Daudpotras, having killed their women folk and thrown their bodies into a well, engaged in a last desperate struggle with the Afghans, in which they were utterly defeated and their chief, Sádik Muhammad, killed.* The remnant escaped across the

A. D. 1747.

*In 1854 there was still in existence, as reported by Captain (afterwards Sir F.) Goldsmid, a long room containing 19 graves of Daudpotra heroes; and the well into which the bodies of the women were thrown was pointed out. They are now built over, but the site is known and goes by the name of *Khatko Maho.*

Indus under Bahawal Khan, the eldest son of Sádik, who afterwards built the town of Bahawalpur and became the founder of a kingdom. Thus the Daudpotras passed out of Sind.

Their old foe Nur Muhammad was also unhappy. It is unfortunate that the history on which we have chiefly to rely for this period, the Tuhfat-ul-kiram, was written at Tatta under the rule of a Kalhora, a circumstance which enjoined discretion on the author; but we may read between his lines that Nur Muhammad was never trusted by Nadir Shah, who left an agent of his own at Tatta under some diplomatic designation. So we may presume that he had to pay his tribute of 12 lakhs or so *per annum* regularly, little as he liked it. When Ahmad Shah succeeded Nadir, he conferred the title of Shah Nawáz on Nur Muhammad, the significance of which new honour was that the tribute hitherto due to Nadir was henceforth due to Ahmad. But Nur Muhammad had seen in the change of rulers a possible occasion for shaking it off altogether, and he took steps towards this end which brought Ahmad Shah down upon him in person. This occurred during one of Ahmad Shah's invasions of India, in 1752 or 1754. Nur Muhammad sent his Hindu *Diwan*, Gidumal, to the king's camp at Naushahro, who is said to have appeased the angry king, but the fact remains that Nur Muhammad fled to Jesalmir and died there in 1755. Some events of Nur Muhammad's rule, otherwise petty, throw light on the condition of lower Sind at that time. We find him constantly fighting with local chiefs, who appear to be semi-independent and some of whom are clearly Hindus. Six of these, by name Tamáchi, Togháchi, Tháru, Silah, Kahah and Asu Sumra, are described as chiefs of Wangah in the Cháchikán taluka. This was the region to the southwest of Tando Bago in the taluka of that name. Much more important were the Jám of Kakrála, who held a tract of country between Shahbandar and the Indus, and the Rána of Dharája in the Mirpur Sakro taluka. The latter is said to have instigated the hill tribes to come down and attack Tatta, and Thano Bula Khan marks the camp of Bula Khan Naomardia, who went out to oppose them. A member of those same hill tribes, one Bijar Jokia, was afterwards employed to assassinate the Rána, which he did. The Kalhoras thus got possession of Dharája and extended their power to the sea, while Bijar was rewarded with

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the title of Jám of the Jokias. The prestige which this gave him helped him to acquire, after much fighting with Barfatis and other tribes, to a kind of supremacy over all the low country from the Hab to the Delta. These particulars are recorded in the interesting family annals kept by Seth Naomal and indicate how the Jokias, a Baluch tribe, may have come to occupy the position which they had in the Karáchi district at the time of the British occupation.

Through the Diwan Gidumal's good offices Nur Muhammad's eldest son, Muhammad Murad Yar Khan, was appointed in his father's place with the fine title Sarbuland Khan, *i. e.*, Khan of the Lofty Head ("Yet within three days shall Pharoah lift up thine head"); but proving incapable and tyrannical, he was deposed by the chief men and Ghulam Shah, his brother, elected in his place. The Afghan king, however, ignored the chief men and gave his *sanad* to another brother, Atur Khan, who was a hostage at his court; so Ghulam Shah had to get away with all haste. But the revenues of the country failed and the exactions from Kandahar became more galling and the people cursed Atur Khan the incompetent. Then Ghulam Shah came back and Atur took flight. He returned with an Afghan force and his brother joined him and the three fought and desolated the country for a while. Finally Ghulam Shah, having conclusively proved himself the best man and got a firm hold of all Sind, was acknowledged by Ahmad Shah and created a Shah Wardi Khan. His rule properly dates from this event, which occurred in 1762. Ghulam Shah, though the son of a dancing girl and illiterate, was a great man, and having won his throne by his own sword, he was much more independent of Kandahar than his father ever had been. He made a solid kingdom of Sind and pushed its frontier southwards to the seaboard, turning out the Jám of Kakrála and founding the new seaport of Shahbandar with a strong protecting tower.

Rule of Ghulam Shah Kalhora A. D. 1762.

He also invaded Kach (Cutch) about 1762 A. D., but being successfully resisted revenged himself by damming the Puran, so as to turn its waters into his own territories and make a desert of the fertile tract that extended from his frontier to Lakhpat. But his dominion did not include Shikarpur, which, as part of the Sibi division, had been under Afghan governors since the expulsion of the Daudpotras. It was in the time of Ghulam Shah and perhaps

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on his invitation that the East India Company established a factory at Tatta; which was discouraged by his less enlightened son and abandoned in 1775. In 1768 Ghulam Shah resolved to find a better capital for Sind than Khudabad and fixed on Nerunkot on the left bank of the Indus, where there had been a town with the name Nerun in ancient times. Here, on high ground, he built a strong fort and called it Hyderábád, which remains his most lasting monument. Here he lived for four years more and died and was buried. Of the well known tombs to the north of Hyderábád, that of Ghulam Shah, though sadly dilapidated, is by far the finest and was selected by Lord Curzon as the only one that deserved to be restored and kept in repair at public expense.

Founding of Hyderabad A. D. 1768.

The "nobility of the Fakirs" assembled and elected Sarafraz Khan, the son of Ghulam Shah, to succeed him. The succession was undisputed and was confirmed from Afghanistan with the title Khuda Yar Khan. Sarafraz had scarcely ruled for two years, however, when he committed a crime which started the downfall of his house. In the days of Yar Muhammed Kalhora a brave Baluch, by name Mir Shahdad Khan Tálpur, who had been rewarded with a *jagir* by the prince Moiz-ud-din for distinguished military service, attached himself to the Mián as his spiritual guide and military chief. His tomb is at Shahpur in the Sakrand Taluka of the Hyderábád District and bears the date 1147 A. H. =1734 A. D. His son Mir Bahram continued faithful to the saintly house, and in the troubles which followed the death of Mián Nur Muhammad he took the winning side and afterwards became the most trusted councillor of Mián Ghulám Shah. When Mián Sarafraz Khan succeeded to the throne Bahram was getting old and his son Bijar was gradually coming to fill his place in the council chamber. But the slanders of another courtier, Raja Likhi, or else his own evil star (the author of the Fatehnama is unable to decide between them) turned the mind of Sarafraz against the Mirs, and one day in 1774 or 1775 he caused the aged Bahram and his son Sobdar to be treacherously murdered in his own presence without provocation. The elder son, Mir Bijar, was on a pilgrimage to Mecca and so escaped. But he had a cousin, Fateh Khan, who took up the family quarrel to such good purpose that Sarafraz had to fly for his life. His adherents, after some plotting and counterplotting, got Mián Ghulam Nabi, a son of Nur Muhammad

RISE OF THE TALPURS.

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and therefore uncle of Sarafraz, put on the throne. He is represented as a good man but beset by evil councillors, and when Mir Bijar returned from Mecca with 6,000 vengeful Baluchis, Ghulam Nabi was forced against his own inclination to give him battle and perished. The author of the Fatehnama says that he was killed by his own side. During his rule he had kept all possible claimants to the throne in durance at Hyderábád, so his brother Abdul Nabi was able to put them all out of the way at a stroke and succeed him. Mir Bijar acknowledged him, evidently on the condition of becoming his chief minister, and he was crowned, or rather turbanned, with great pomp at Khudabad. Then followed a very grievous time for Sind. No doubt Abdul Nabi was a rare villain even for his time; but his position was also a very difficult one. Though the Mirs had twice refrained from taking the supreme power when it was in their grasp, probably from a superstitious reverence for the Fakir dynasty, it is evident that they were like the sons of Zeruiah in the court of King David, and the cowardly Abdul must often have said in his heart, "These men the sons of Talpur be too hard for me, and I am this day weak though anointed king." They were intolerable but indispensable: he felt the first truth but could not see the second. Accordingly, after Mir Bijar had defeated at Shikárpur an Afghan army sent to enthrone a cousin of his in his place, and again saved him by diplomacy from the vengeance of Kandahar, he got him treacherously murdered by two envoys from the Raja of Jodhpur, who had probably come to arrange about the cession of Umarkot, which Abdul secretly sold to Jodhpur about this time. Popular rumour said the murder of Bijar was the price. But Mir Bijar only gave place to Mir Abdulla, as strong a man as himself, and Abdul Nabi had to fly to Kalat. An obscure scion of the house of Kalhora was then found and put up as a puppet and Mir Abdulla began to rule Sind. His first act was to scatter an army of Rajputs sent by the king of Jodhpur and the next was to face Abdul Nabi, who had come as far as Lárkána at the head of a force hired from the Khan of Kalat, and defeat him signally. From Kalat Abdul turned to Kandahar and procured the help of an Afghan army under one Madad Khan, but on the condition that it should find its own cost. This condition Madad Khan exacted to a good deal more than the last farthing, plundering the country mercilessly and compelling Abdul to do

the same. When he failed his councillors were seized and forced by torture to disgorge their own wealth. Sehwán and Khudabad were sacked and the Afghans went as far as Umarkot, leaving ruin and despair in their track. The Mirs were respectfully defiant from a distance until Madad Khan, having got all he could out of the country, left Abdul to shift for himself and went away. Then Abdul humbled himself and came to the Mirs, kissed the Kuran, put it on his head, swore to be faithful and true, and cast the spell of the fakir once more on those fearless but infatuated men. They received him back and he filled the cup of his iniquities and brought down the doom of the House of Kalhora. Gradually inducing Mir Abdulla and Mir Fateh Khan to lay aside their suspicions and precautions, he suddenly entrapped them and beheaded them both. This occurred in 1783, or thereabouts. At once the aged Mir Fateh Ali Khan and the sons of the murdered Fateh Khan and Ghulam Ali and Sohrab and Alahyar and Thára were out raising the Baluch bands. Abdul Nabi also made haste to raise an army of Khosas and Jatois and Naomardis and every tribe that was at feud with the Baluch. The two armies met at Haláni in the Kandiáro Taluka of the Hyderábád District and the Baluchis won the day. Abdul Nabi just escaped with his life and fled never to return. After one or two futile attempts to invade Sind he took refuge with the Raja of Jodhpur, where his descendants have continued to live in honour.

Fall of the Kalhoras A. D. 1783.

Before Abdul Nabi gave up hope he made an appeal to Kandahar, but the Mir had emissaries there too and they prevailed. The Afghan king, Taimur Shah, closed the question by sending to Mir Fateh Ali Khan a robe of honour, some Arab horses and a *sanad* appointing him ruler of Sind. This appears to have occurred in 1783, from which date the rule of the Talpurs may be reckoned.

The Kalhoras had been in power for 82 years and it is evident that during that period a permanent change had begun to be effected in the centre of gravity of Sind and the balance of the several elements of its population, which was completed by the Talpurs. From a very early time the two natural centres of government had been Tatta and the fortress of Bukkur, and of these Tatta had always been comparatively free from foreign influence. At Umarkot and Kakrála and minor places Hindu

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rulers had held more or less independent power and, as we have seen, even the Musalman rulers, forming matrimonial aliances with Soda and Rajput chiefs, had become Hinduised to some extent. The rise of the "Sirais" (men of the Upper country), as the Kalhoras and Talpurs were commonly called in Lower Sind, changed all this. When they were shut off from Shikárpur and Sukkur, they extended their power southward and eastward, stamping out Hindu independence. The necessity for a more central capital followed and Hyderábád was built, overshadowing Tatta. Khudadad and Sehwán declined, but Lárkána rose to importance as a frontier town facing Shikárpur. Then the tyrannical treatment of Hindus gradually completed the ruin of those towns of which the importance was industrial or commercial. The narrative of Lieut. (afterwards Sir Henry) Pottinger, who was a member of the British Mission to Sind in 1809, is eloquent on this subject. "Even so recently," he says, "as the period of Nadir Shah visiting Tatta on his return from Delhi, it is said there were 40,000 weavers of calico and loongees in that city and artizans of every other class and description to the number of 20,000 more, exclusive of bankers, money-changers, shopkeepers and sellers of grain, who were estimated at 60,000 more; whereas the aggregate population of it, at the present day, is believed to be over-rated at 20,000 souls." "The only manufactures now carried on in Tatta are those of a few white cloths and coloured loongees, and in lieu of the bustle of a great trading city, the streets are deserted, the few shops that remain are scarcely worthy of being called such, in view of the disreputable figure they cut, and the whole bazaar exhibits a deplorable picture of poverty and depressed commerce." Another new influence was the Baluchi. By far the best fighting man in the country and as ready to fight on one side as another, he soon became a principal element in the mercenary forces with which the rival chiefs fought each other, and when the Talpurs came into power he became supreme. An intolerant Musalman, he left no place for the Hindu as a soldier and barely tolerated him as a trader. But he could not dispense with him as a quill-driver, for he himself was too indolent and too ignorant to keep accounts or manage revenue. So the supple Hindu often returned to a great measure of influence by that road. But he paid a heavy price for it in degradation and suffering. The

following remarks by Dr. James Burnes, who was invited to Hyderábád in 1830 to cure Mir Ali Murad of some disorder which had defied the skill of his own physicians, are confirmed by several other authors. "It is really difficult to conceive how any Hindoos should have continued to reside in the country; and the fact can only be accounted for by that attachment, which man shares with the vegetable, to the soil in which he is reared. The indignities they suffer are of the most exasperating description. They are even forced to adopt the Mahommedan dress and to wear beards. Till lately none of this class were permitted to ride on horseback, and amongst the few who now enjoy this privilege a small number only, in the immediate service of government, are allowed the comfort and honour, as it is esteemed, of a saddle." "It is in the power of any two 'true believers,' by declaring that a Hindoo has repeated a verse from the Koran, or the words 'Mahomed the Prophet,' to procure his immediate circumcision. This is the most common and, by the persecuted class themselves, considered the most cruel of all their calamities." Dr. Burnes was presented with a valuable sword bearing a Persian verse inlaid in gold, to the effect that, if wielded by a brave man, it would consign a hundred thousand Hindus to perdition.

Under such treatment it is no wonder if a large proportion of the Hindu population either forsook the country or sought safety in the religion of their persecutors. When Captain Alexander Hamilton visited Tatta in 1699, the religion as by law established was Mahomedan, but there were ten "Gentows, or Pagans," for one Musalman: now the proportion is nearly reversed. But at that time the Gentows had full toleration for their religion and kept their feasts and fasts "as in former times, when the sovereignty was in Pagan hands."

Rule of the Talpurs, A. D. 1783 to 1843.

Fateh Ali Khan soon found that a royal *sanad* could not make him ruler of Sind. The Talpur chiefs, who had thrown off the yoke of a holy Kalhora, were not disposed to bow their necks to a mere Talpur like themselves. Fateh Ali's nephew, Mir Sohrab Khan, was foremost in asserting his independence and set up his throne at Khairpur. There was trouble with Kandahar too, for several invasions occurred during the next few years, probably on account of failure to pay the tribute. Finally in 1792 a treaty was signed at Shikárpur and Fateh Ali Khan, paying 24 lakhs of

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rupees on account of arrears of tribute, received a fresh *sanad* and a jewelled sword and an elephant, on which he rode to Hyderábád and installed himself with due pomp. The government of Sind now became a confederacy of chiefs ruling each his own share independently. Fateh Ali Khan, taking into partnership his three brothers, Ghulam Ali, Karam Ali and Murad Ali (called the "Char yar" or four friends) ruled at Hyderábád; Mir Sohrab, head of the Sohrabani branch, ruled at Khairpur; and Tharah Khan, with his uncle and the sons of the murdered Mir Abdulla, comprising the Manikani branch, at Mirpur. In 1802 Fateh Ali died and was buried at Khudabad. Ghulam Ali, the next senior, was killed in 1811 by a buck which he had wounded, whereupon his son took the last place in the triumvirate, the others moving up a step. Similar changes took place at Khairpur and Mirpur which it is unnecessary to detail here.* It only remains to notice a few events of importance which occurred before the final appearance of the British on the arena. In 1795 the Talpurs recovered Karáchi, which had been ceded to the Khan of Kalat by the Kalhoras as the price of the blood of the Khan's brother, who had been slain by them in battle. It had now grown into a great port, superseding all the bunders of the Delta, and had been fortified and garrisoned by the Hindu merchants to whom it owed its rise: and they defended it with such spirit that two attempts to take it failed. When a third Baluchi army appeared before its walls and the Khan was clearly too much distracted with troubles elsewhere to give any assistance, the merchants opened negotiations and surrendered it to the Mirs on honourable terms. In 1803 Shuja-ul-Mulk again invaded Sind demanding arrears of revenue, but was pacified with 10 lakhs to account and a promise of 5 lakhs *per annum* regularly. In 1813 another extension of territory was effected by the capture of Umarkot, which had remained till then in the nominal possession of Jodhpur. The forts of Islamkot and Fatehgarh had already been built to overawe the desert, which thus came completely under the power of the Mirs. Finally in 1824 they cleverly secured the town of Shikárpur and with it the whole of the country dominated by it, for they had already, by trick or treaty, got possession of Sukkur and several other towns in that district. Shikárpur had remained

* The relationship of the chiefs ruling in 1843 will be understood from the accompanying genealogical tree.

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under governors deputed from Kandahar and had grown into one of the great commercial cities not of Sind only but of Asia. Lying on the trade route to Sind through the Bolan Pass, it became a stopping place for caravans and soon attracted a colony of Banias, who established agencies in every commercial town in central Asia. The Mirs coveted the customs revenues of such a town and found their chance during the troubles that befell the throne of Afghanistan about this time. A rumour that the Sikhs meditated an attack on Shikárpur spread through the country at a time when the governor had been summoned to Kandahar, and the Mirs at once assembled an army under the walls of Shikárpur and cajoled or frightened the weak *locum tenens* into leaving the defence of the town to them. Having taken possession, they never gave it up. It illustrates the curious system under which Sind was governed at this time that the revenues of Shikárpur were divided between the Mirs of Hyderábád and Khairpur, each maintaining a separate governor and establishment to collect his share.

THE BEGINNING OF BRITISH INTERCOURSE WITH SIND.

At the beginning of last century Sind was almost an unknown country to the English. In 1758 the East India Company had been allowed to establish factories at Tatta and Auranga Bandar by Ghulam Shah Kalhora, who was very friendly and granted special immunities to the agent; but his son Sarafraz showed a different spirit and his interferences became so vexatious that the factory was closed in 1775. In 1799 relations were re-opened by the deputation of Mr. Nathan Crow to Sind as political and commercial agent, and Mir Fateh Ali Khan promised protection and privileges to British trade and even allowed Mr. Crow to build a house at Karáchi; but he did not fulfil his promises and at last, under the sinister influence, as was supposed, of Zaman Shah the Afghan King, he ordered Mr. Crow to depart within ten days. This occasioned a loss to the Company of more than a lakh of rupees, for which compensation was demanded; but when the machinations of Napoleon Buonaparte in Persia began to excite apprehension, this claim was waived and an offensive and defensive alliance was negotiated at Hyderábád through Captain Seton in 1808. The Supreme Government refused to ratify this and next year sent Mr. N. H. Smith of the Bombay Civil Service to Hyderábád to negotiate a fresh treaty. To Lieut. (afterwards Sir Henry) Pottinger, who was an assistant to the envoy, we owe an interesting account of this mission. It reached Karáchi on 9th

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May 1809, but could not proceed till the 10th of June, so many were the petty and insulting obstructions thrown in its way. The suspicions and alarm of the Mirs would be as incredible as they are amusing were they not abundantly confirmed by the experiences of subsequent missions. At Hyderábád the envoy and his suite were requested to go to their first interview without their swords, and when the proposal was rejected with indignation, the behaviour of the Mirs showed that they were seriously apprehensive of assassination. The mission succeeded however in compelling the Mirs to reconstruct their ideas of the relative importance of themselves and the British Government, and a short treaty was concluded providing for the exclusion of the French from Sind and for the mutual despatch of *vakils* between Bombay and Hyderábád. The Mirs concerned in this treaty were those of Hyderábád only, Ghulam Ali, Karam Ali and Murad Ali. Ghulam Ali died, as above related, in 1811 and a fresh treaty was concluded with the survivors in 1820. It provided that all Europeans and Americans should be excluded from Sind and that the subjects of either government should be permitted to reside in the territories of the other; also that the Mirs should restrain the raids of their subjects into Cutch and the neighbouring friendly states. In 1831 a present of five horses from the King of England to the Maharaja Ranjit Singh had arrived in Bombay and it was decided to send them to Lahore with Lieut. (afterwards Sir Alexander) Burnes by the Indus with a view to the exploration of that river. This mission met with every sort of indirect opposition. While hypocritical letters from Hyderábád urged the dangerous and in fact absolutely innavigable character of the river, the local authorities would not allow Mr. Burnes to land and prevented him from getting drinking water. Twice he had to return to Cutch, but a third time he overcame all resistance and reached Hyderábád, where he was received with profuse apologies and expressions of friendship by Mir Murad Ali, now sole ruler there, whom his brother had cured of a serious illness a few years before. The prophetic apprehensions which occasioned all this opposition came out in the remark of a bystanding Sayad, "Alas!" he said, "Sind is now gone. The English have seen the river which is the road to its conquest." On this Mr. Burnes comments thus, "If such an event do happen, I am certain that the body of the people will hail the happy day." Elsewhere he speaks more strongly. "This

tribe (the Baluchis) composes but a small portion of the Sindian population, and while they are execrated by the peaceable classes of the community for their imperious conduct, they, on the other hand, hate the princes by whom they are governed. It would be difficult to conceive a more unpopular rule, with all classes of their subjects, than that of the Ameers of Sind. Nor is the feeling disguised; many a fervent hope did we hear expressed in every part of the country, that we were the forerunners of conquest, the advanced guard of a conquering army." This view of the feelings of the people is corroborated by other writers and confirmed by the immediate and willing acceptance of British rule by the whole province on the overthrow of the Mirs. Mr. Burnes was received in quite a different spirit at Khairpur, where the old Mir Rustam, a man of countenance and manners "peculiarly mild," expressed a keen desire for a British alliance. In 1832 yet another treaty was concluded with the view of opening up the Indus to trade. The first clause, as usual, declared eternal friendship and the second provided that neither state should ever, from generation to generation, look with the eye of covetousness on the possessions of the other. The other provisions were that the Indus and the roads in Sind should be open to the merchants and merchandise of Hindustan, subject to fixed duties, on condition that no military stores should pass by them, no armed vessels should enter the Indus and no English merchant should settle in the country, though they might visit it after obtaining passports. A similar treaty was at the same time concluded with the Mir of Khairpur. This was amended in 1834 by a treaty modifying the river dues.

ENTRY OF BRITISH TROOPS INTO SIND.

We now come to the political events which led to subsequent, more questionable treaties. The Duráni kingdom was broken up and Shah Shuja-ul-Mulk was an exile in India. Dost Muhammad ruled at Kabul and other chiefs independently at Kandahar and Hirat. The Maharaja Ranjit Singh had taken Cashmere and part of Multán from the Afghans and in 1836 invaded Sind and threatened Shikárpur, claiming 12 lakhs of rupees as tribute. The Mirs, unable to resist him by force, accepted British mediation on the condition, unpalatable though it was, that they should receive a British Agent at Hyderábád and conduct all their negotiations with Ranjit Singh through the British Government. So far they had little to complain of, though their behaviour had been most unfriendly and provoking. But in the meantime fears

History. of Russian designs on Afghanistan had led the Governor General, Lord Auckland, into the policy which ended in the disastrous attempt to reinstate Shah Shuja in the throne of that country, and in pursuance of that he had made a tripartite treaty with Shah Shuja and Ranjit Singh. By one clause of that Shah Shuja bound himself to relinquish all claim to supremacy over Sind, or tribute from it, on the Mirs paying whatever sum the British Government might determine, of which sum 15 lakhs were to be paid to Ranjit Singh. Shah Shuja does not appear to have acquainted Lord Auckland with the fact that he had already relinquished all his claims on Shikárpur and Sind by a solemn engagement written on the Koran, and so Lord Auckland thought it just to demand from the Mirs some equivalent for the emancipation which he supposed he had secured to them. The nature of this was dictated by the necessities of the situation. They were required to allow and assist the passage of the British army through Sind to Afghanistan, to permit the temporary occupation of Shikárpur and some other territory as a military base, and to suspend that article of the treaty of 1832 which forbade the transport of military stores by the Indus. The angry resistance of the Mirs to these demands began that chain of negotiations, enforced treaties, misunderstandings, threats and enhanced demands which culminated in the battle of Miani. At this time four Mirs were ruling at Hyderábád, Nur Muhammad, Nasir Khan, Muhammad Khan and Sobdar, one at Mirpur Khas, namely Sher Muhammad, and one at Khairpur, the aged Rustam Ali Khan. They all dreaded the British power and deeply distrusted British designs, and they also distrusted each other. Those at Hyderábád used at one time to sleep in the same room, and they never hunted unless all could go together, for no one was trusted out of sight by the rest. Those at Khairpur and Mirpur were independent of Hyderábád but at variance among themselves. Add to all this that their control over the minor Baluch chiefs was extremely precarious. The resultant of such a combination of variable forces could not be a straight line, and the political officers needed exhaustless patience as much as tact and firmness. The Mirs vacillated, were insolent and submissive by turns, made promises and gave strict injunctions to their officers not to act up to them, and broke out occasionally in silly acts of treachery and violence which brought worse conditions on themselves. After they had agreed to the passage

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also about the interpretation of some articles of the treaty and there had always been delay and difficulty in realising the tribute due under it. So, as soon as the Afghan storm had blown over, it was decided that a revision of its terms was necessary, and Lord Ellenborough, who had succeeded Lord Auckland in 1842, introduced a principle of commuting all pecuniary demands on native states, when possible, to cessions of land. He also introduced another change which excited much comment. There had been continual jealousy between the military and political departments. He withdrew the political officers and appointed Sir Charles Napier, with supreme civil and military control, to settle matters, amicably if possible, but to settle them. Sir Charles was shrewd enough to see the situation exactly and he put it in a nutshell. "We have no right to seize Sind," he said, "yet we shall do so, and a very advantageous, humane and useful piece of rascality it will be." Whether he was not himself mainly responsible for the consummation of that piece of rascality became a subject afterwards of long and acrimonious controversy. His cause was much injured by his brother Major-General William Napier, whose bombastic history of the Conquest of Sind evoked a "Commentary" from Major Outram. The Bombay papers ("a hireling press" according to General Napier) sided with the latter and so did the author of "Dry Leaves from young Egypt." Those who will may read and judge for themselves. So much is certain, that Sir Charles knew nothing of India, its people or its languages, and was unversed in diplomacy and impatient of forms; so that there was more than a little truth in Major Outram's statement of the effects of his appearance on the arena. "Prior to Sir Charles Napier's arrival," he says, "the Princes of Sind had been treated with the consideration due to their rank and that demanded by their own ideas of propriety. No sooner did that officer arrive amongst them than all was changed. They were addressed in a tone of arrogant contempt, which was as offensive as it was new and unexpected, and the conventional courtesies to which they had been accustomed were suddenly dispensed with. Rumour told them that we contemplated the seizure of the country; and the sudden dismissal from office of the diplomatic body, to which they had been accustomed, the imperious tones of the dictator who succeeded, and the extensive military preparations which they

SIR CHARLES NAPIER.

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beheld, all tended to convince them that such was really our intention." Sir Charles arrived at Karáchi on 10th September 1842 and started for Sukkur, stopping at Hyderábád on his way to see the Mirs and give them, in his brother's words, "an austere, but timely and useful warning, that the previous unsteady, weak policy of diplomatic agents in Scinde would no longer facilitate deceitful practices." At Sukkur he set himself to getting the small body of troops at his disposal into fighting trim, and also to inquiring into the alleged treachery of the Mirs, no easy matter where making false seals was a trade and it was difficult to get a *munshi* who was not in the pay of somebody. Of course the Mirs had information how he was occupied and that a new treaty was to be forced on them; but its terms were not known and had to be invented in the bazaars. No wonder that daily reports came of secret conclaves, gatherings of armed men and summonses sent to border tribes. Then Mir Ali Murad came to see Sir Charles Napier. He was the youngest son of Mir Sohrab, one of the founders of the Talpur rule, who, dying in 1829, had left his possessions to his three sons, Rustam, Mubarak and Ali Murad, then an infant. When he grew up Ali Murad declared that he had been defrauded of his rightful share. The month after Sir Charles Napier's arrival the matter came to blows. Ali Murad met Rustam and Nasir Khan, the son of Mubarak, who was dead, in battle and defeated them and compelled them to sign the Naonahar Treaty making over nine of their villages to him. Now he suspected that Rustam intended to defraud him again by bequeathing to one of his sons the turban of chieftainship, which should descend by Baluchi law to the brother. So he came to see the General. On being assured that after the death of Rustam his right would be upheld, he became and remained the consistent supporter of the English cause.

On the 4th and 6th of December the draft treaty was tendered to the Mirs at Khairpur and Hyderábád respectively. It provided for the cession of Karáchi, Tatta, Sukkur, Bukkur and Rohri to the British Government in perpetuity and of a large tract of country north of Rohri to the Nawab of Baháwalpur (from whom the Mirs had wrested it) as a reward for his faithfulness and a penalty for treachery which was considered to have been clearly established against Rustam and Nasir Khan. There was matter for difficult

adjustment in apportioning the shares of each Mir in the cessions and there were several other clauses which were calculated to excite opposition, but on the other hand all tribute was to be remitted, so that on the whole most of the Mirs stood to gain more than they lost, and Major Outram (who was recalled early in January, 1843, at the special request of Sir Charles Napier) believed that there would be little difficulty in getting their assent to it if properly put before them. The manner in which it was actually put before them was as follows. It was presented at Khairpur by messenger on 4th December and on the 7th the Mirs signified, under protest, their willingness to sign it. Sir Charles issued a proclamation on the 8th intimating that he would now take possession of the lands ceded by it to Baháwalpur and forbidding any one to pay revenue to the Mirs after the 1st of January. A few days later he crossed the Indus with his little army. Mir Rustam, eighty-five years of age, feeble in mind and body, distracted by the plots of Ali Murád, the violence and disobedience of his own sons and the intrigues of a scoundrelly *wazir*, was at his wits end to guess what all this portended. He wrote to the General to say that he would come to his camp and throw himself on his protection. He was told to seek the protection of his brother Ali Murád. He went to his brother's fort Deji-ka-kot and a few days afterwards Sir Charles Napier was informed by Ali Murad that Rustam had, by a solemn engagement on the Koran, resigned the turban and his territories to him. It was afterwards proved that this abdication had been extorted from the old man against his will, which indeed Sir Charles himself strongly suspected at the time and wanted to see him; but he fled to the desert and took refuge with his sons. Major Outram attributed his panic to the "villainy" of Ali Murad, to whom of course it was an imperative necessity to prevent any chance of a personal explanation and who had both the means and the will to intercept letters, circulate false reports and scare the old man with fears of being made a prisoner by the fierce General who respected no man. Meanwhile consternation spread through Khairpur and the town was forsaken. Ali Murad "protected" it and took possession of all that was Rustam's. The news filled the Baluchi chiefs with fury, not at the British primarily, but at Ali Murad, and they resolved to agree to nothing till Rustam was re-instated. Sir Charles Napier on the other hand resolved to treat with nobody who did not

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acknowledge Ali Murad as now the legal *Rais.* He was offended at Mir Rustam's flight and believed he had joined his sons in the desert to prepare for war. He resolved to produce an effect by the unprecedented feat of a march through the desert to the fort of Imamgarh, the Gibraltar of the Khairpur Mirs, as he was informed, where they massed their treasures. He found it deserted and empty, save for a little corn and some bad gunpowder, so he blew it up and marched for Hyderábád, where he had ordered all the Mirs to collect and given them till the 7th of February to sign the treaty and disband their forces. But a secret message from the agents of the Mirs at the British camp had gone before him :— "The General is bent on war. Be ready." Major Outram in the meantime had with difficulty obtained permission to go to Hyderábád and make a last effort to save the Mirs. He wished to go without an escort, but Sir Charles insisted on one. He was joyfully received, but he had no easy task. The Mirs expressed readiness to agree to every term of the treaty on condition that Rustam was restored to his rights, but Major Outram had no authority to open this question. Then they said, "Let us settle accounts with Ali Murad ourselves." He was forced to tell them that that would certainly be considered an act of hostility to the British. All the while Sir Charles and his army were advancing in spite of Major Outram's entreaties that he would stop, and the alarm at Hyderábád and the gathering of desperate men increased. It is clear that Sir Charles had for some time ceased to contemplate the possibility of a peaceful solution of the quarrel. He distrusted all the professions of the "barbarians" and believed they were only trying to gain time, which he resolved not to give them. Major Outram on the other hand was convinced that they had too wholesome a fear of the British power to desire war and would never resort to it unless driven to desperation. At last, by great firmness and tact, he induced the Mirs of both Khairpur and Hyderábád to put their seals to the treaty on the 12th of February and sent word to Sir Charles Napier. But that act fired the mine. As soon as it was known the Baluchis got out of hand and, for the first time in all his Sind experience, Major Outram was hooted and cursed as he left the fort. That evening the Baluch Sardars met and took an oath on the Koran never to sheathe the sword until Rustam's wrongs were righted. On the morning of the 15th the Agency

ATTACK ON THE RESIDENCY.

building, which stood on the bank of the river and was surrounded on the other sides by a wall only four or five feet high, was attacked by 8,000 Baluchis. Fortunately a company of H. M's 22nd Regiment had arrived three days before, and these, with only 40 rounds of ammunition per man and commanded by five young officers, held the enemy at bay for four hours, assisted by the guns of the river steamers Planet and Sattellite. By that time the enemy had brought six guns to bear on the place, so, the camp followers and some baggage having been put safely on board the Planet, the force was skilfully withdrawn and steamed up the river to the General's camp. **History.**

The sword was now openly drawn and Sir Charles Napier advanced at once. He had only 2,800 men of all arms, for a strong force had to be left in charge of Sukkur, and the enemy's strength was variously estimated at from 30, to 100,000; but odds appear never to have made any difference to him. Early on the morning of the following day (17th February) Captain John Jacob, who had been sent ahead with a party of the recently levied Sind Horse to look for the enemy, found the Baluchis strongly posted on the Fuleli, near Miani, about 9 miles from Hyderábád. Major Outram had been sent forward the night before to burn some *shikargahs* in which it was thought they might seek cover, and as the smoke of his fires rose in the distance, about 9 o'clock, the General formed his line of battle. The popular story that his despatch announcing the result contained the single word "Peccavi" lacks historical support. The following is *part* of the text of his official report:—

"The forces under my command have gained a decisive victory over the army of the Mirs of Upper and Lower Sind. * * On the 16th I marched to Matari. Having there ascertained that the Mirs were in position at Meeanee (ten miles distant), to the number of 22,000 men, and well knowing that a delay for reinforcements would both strengthen their confidence and add to their numbers, already seven times that which I commanded, I resolved to attack them, and we marched at 4 A. M. on the morning of the 17th. At eight o'clock the advancedguard discovered their camp; at nine we formed in order of battle, about 2800 men of all arms, and twelve pieces of artillery. We were now within range of the enemy's guns, and fifteen pieces of BATTLE OF MIANI.

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artillery opened upon us and were answered by our cannon. The enemy were very strongly posted; woods were on their flanks, which I did not think could be turned. These two woods were joined by the dry bed of the Fuleli, which had a high bank. The bed of the river was nearly straight, and about 1,200 yards in length. Behind this and in both woods were the enemy posted. In front of their extreme right, and on the edge of the wood, was a village. Having made the best examination of their position which so short a time permitted, the artillery were posted on the right of the line, and some skirmishers of infantry, with the Sind Irregular Horse, were sent in front, to try and make the enemy show his face more distinctly; we then advanced from the right in *echelon* of battalions, refusing the left, to save it from the fire of the village. The 9th Bengal Light Cavalry formed the reserve in the rear of the left wing, and the Poona Horse, together with four companies of infantry, guarded the baggage. In this order of battle we advanced as at a review across a fine plain swept by the cannon of the enemy. The artillery and Her Majesty's 22nd Regiment in line formed the leading *echelon*, the 25th Native Infantry the second, the 12th Native Infantry the third and the 1st Grenadier Native Infantry the fourth. The enemy was a thousand yards from our line, which soon traversed the intervening space. Our fire of musketry opened at about a hundred yards from the bank, in reply to that of the enemy, and in a few minutes the engagement became general along the bank of the river, on which the combatants fought for about three hours or more with great fury, man to man. Then, my Lord, was seen the superiority of the musket and bayonet over the sword and shield and matchlock. The brave Baluchis, first discharging their matchlocks and pistols, dashed over the bank with desperate resolution; but down went these bold and skilful swordsmen under the superior power of the musket and bayonet. At one time, my Lord, the courage and numbers of the enemy against the 22nd, the 25th, and the 12th Regiments bore heavily in that part of the battle. There was no time to be lost, and I sent orders to the cavalry to force the right of the enemy's line. This order was very gallantly executed by the 9th Bengal Cavalry and the Sind Horse, the details of which shall be afterwards stated to your Lordship, for the struggle on our right and centre was at that moment so fierce, that I could not go to the left. In this

charge the 9th Light Cavalry took a standard and several pieces of artillery, and the Sind Horse took the enemy's camp, from which a vast body of their cavalry slowly retired fighting. Lieutenant Fitzgerald gallantly pursued them for two miles, and I understand slew three of the enemy in single combat. The brilliant conduct of these two cavalry regiments decided, in my opinion, the crisis of the action, for from the moment the cavalry was seen in the rear of their right flank the resistance of our opponents slackened; the 22nd Regiment forced the bank, the 25th and 12th did the same, the latter regiment capturing several guns, and the victory was decided. The artillery made great havoc among the dense masses of the enemy, and dismounted several of their guns. The whole of the enemy's artillery, ammunition, standards, and camp, with considerable stores and some treasure, were taken." **History.**

The loss of the Baluchis in this action was computed at 5,000, while on the side of the British it did not exceed 257, of whom nineteen were officers. Another account refers to the battle as a "dispersing of what was little better than a vast mob." "They had no discipline," says the same narrator, "and bands of twenty men rushed out at a time with no order or method, only to impale themselves on the bayonet, or to be swept away by grape." Immediately after the battle the chief Mirs of Hyderábád and Khairpur, excluding two who were not present at the battle, waited on Sir Charles Napier and presented their swords, which he graciously returned. He marched at once to Hyderábád, of which he got possession quietly on the 19th.* Here he soon discovered that the Mirs were "such thorough-paced villains" as he had never met with in his life, and he kept them all under a guard in a garden close to his camp, where he has been accused of treating them rather brutally. But in truth his position at this time was exceedingly difficult. Mir Sher Muhammad of Mirpur, the most determined man among them, was not in time for Miani, but added the fugitives from that field to his army and was now approaching with 20,000 men. Sir Charles Napier's small force, reduced by his losses in the battle and the detachment which was required to keep the fort, was scarcely more than sufficient to hold his camp.

* It was found that popular rumour had much exaggerated the wealth of the Mirs and, though everything found in the fort, public or private, was seized, the amount realised was much less than had been expected.

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But he never allowed his bearing or his measures to indicate anything but confidence and defiance. When an envoy arrived from Sher Muhammad offering to let him leave the country with his life if he restored all that he had taken, the evening gun happened to fire: Sir Charles turned his back on the envoy and said, "You hear that sound. It is my answer to your chief." At length reinforcements arrived when Sher Muhammad was close to Hyderábád. On the morning of 22nd March the General marched out with 5000 men, of whom 1100 were cavalry, and 17 guns, and found the enemy at a village called Nareja in Dabo, near the Fuleli, eight miles from the town. The following is his own account of the battle which followed:—"The forces under my command marched from Hyderábád this morning at daybreak. About half-past eight o'clock we discovered and attacked the army under the personal command of the Mir Sher Muhammad, consisting of 20,000 men of all arms, strongly posted behind one of those large nullahs by which this country is intersected in all directions. After a combat of about three hours, the enemy was wholly defeated with considerable slaughter and the loss of all his standards and cannon. His position was nearly a straight line; the nullah was formed by two deep parallel ditches, one 20 feet wide and 8 feet deep, the other 42 feet wide and 17 feet deep, which had been for a long distance freshly scarped, and a banquette made behind the bank expressly for the occasion. To ascertain the extent of his line was extremely difficult, as his left did not appear to be satisfactorily defined, but he began moving to his right when he perceived that the British force outflanked him in that direction. Believing that this movement had drawn him from that part of the nullah which had been prepared for defence, I hoped to attack his right with less difficulty, and Major Leslie's troop of horse artillery was ordered to move forward and endeavour to rake the nullah; the 9th Light Cavalry and Poona Horse advancing in line on the left of the artillery, which was supported on the right by Her Majesty's 22nd Regiment, the latter being, however, at first considerably retired to admit of the oblique fire of Leslie's troop. The whole of the artillery now opened upon the enemy's position, and the British line advanced in *echelon* from the left, Her Majesty's 22nd Regiment leading the attack. The enemy was now perceived to move from his centre in considerable bodies to his left, apparently retreating, unable

BATTLE OF DABO.

to sustain the cross-fire of the British artillery; on seeing which, Major Stack, at the head of the 3rd Cavalry, under Command of Captain Delamain, and the Sind Horse, under command of Captain Jacob, made a brilliant charge upon the enemy's left flank, crossing the nullah and cutting down the retreating enemy for several miles. While this was passing on the right, Her Majesty's 22nd Regiment, gallantly led by Major Poole, who commanded the brigade, and Captain George, who commanded the corps, attacked the nullah on the left with great gallantry, and, I regret to add, with considerable loss. This brave battalion marched up to the nullah under a heavy fire of matchlocks, without returning a shot till within forty paces of the entrenchment, and then stormed it like British soldiers. The intrepid Lieutenant Coote first mounted the rampart, seized one of the enemy's standards, and was severely wounded while waving it and cheering on his men. Meanwhile the Poona Horse, under Captain Tait, and the 9th Cavalry, under Major Story, turned the enemy's right flank, pursuing and cutting down the fugitives for several miles. Her Majesty's 22nd Regiment was well supported by the batteries commanded by Captains Willoughby and Hutt, which crossed their fire with that of Major Leslie. Then came the 2nd brigade, under command of Major Woodburn, bearing down into action with excellent coolness. It consisted of the 25th, 21st, and 12th Regiments, under the command of Captains Jackson, Stevens, and Fisher, respectively. These regiments were strongly sustained by the fire of Captain Whitlie's battery, on the right of which were the 8th and 1st Regiments, under Majors Brown and Clibborn: these two corps advanced with the regularity of a review up to the entrenchments, their commanders, with considerable exertion, stopping their fire, on seeing that a portion of the Sind Horse and 3rd Cavalry in charging the enemy had got in front of the brigade. The battle was decided by the troop of horse artillery and Her Majesty's 22nd Regiment."

The Baluchi view of both battles is presented, with that brevity which is the soul of wit, in a Persian manuscript by one of the retinue of Aga Khan, who arrived from Persia in 1842 and was received by the Mirs at Hyderábád. "When they were hemmed in," says the writer, "by the British soldiers on the one hand and cannonade on the other, they gave expression to words, of course in their own language, which distinctly hit off their

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character. When translated they stand as follows :—These rascals do not give us time even to steam ourselves with the hookah."

Before the battle of Dabo was fought, on the 12th of March, Lord Ellenborough had issued a proclamation annexing Sind and had ordered the Mirs to be sent to Bombay as prisoners.

But Sher Muhammad was not subdued yet and for nearly three months he eluded all Sir Charles Napier's efforts to hem him in. At last, on the 13th of June, he encountered Captain Jacob with four companies and two guns, but his followers had no heart to fight and dispersed almost before they had struck a blow. Sher Muhammad escaped across the river and left the country. Some years afterwards he surrendered and was allowed to reside in Sind and pensioned. Before his death he received the honour of a K. C. S. I. The Mírs of Hyderábád and Khairpur, excepting of course Alí Murád, were sent as political prisoners to Poona, where old Mír Rustam and his nephew, Nasír Khán, died. The others were sent on to Calcutta and afterwards to Hazáribág, where they had more opportunity of indulging their love of sport. Within ten years of the conquest, however, it became quite evident that no danger was to be apprehended from their presence in the Province, and the survivors, with their families, were allowed to return in 1854 and good pensions were assigned to them.

T E TALPUR RULE.

As regards the rule of the Mírs and the feelings of their subjects towards them some quotations from the reports of British officers who visited the country have already been given. The government of the Mirs was a despotism supported by a feudal system very similar to that which once prevailed in Europe. When they got the supreme power they gave away a large proportion of the land in the country in *jagir* to the Baluchi chiefs who had fought for them, each of whom was thereafter bound to furnish his quota of troops to the Mírs on occasions of necessity. This system acted as a check on their independence, for, as Lieutenant Postans observed, "apart from their feudatories they possessed in reality no power whatsoever and were dependent on their concurrence ere they could undertake any measures which with other governments would be denominated as those affecting the public weal." They had no standing army beyond a body guard, or force of household troops in constant attendance on them. When they assembled the forces of their Jagirdars they could muster, it is said, about

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50,000 men, but they had to pay them a daily wage of about 2 annas a day to a foot soldier and double that to a horseman. Hence they were in haste to disband them as soon as the immediate necessity for their presence ceased, and this was a wholesome check on "militarism." The revenues of the Mirs were derived from lands not included in *jagirs* and *inams*, customs duties, tolls and taxes on trades, productions and natural advantages. With these the subordinate chiefs had nothing to do. Some notes on them will be found in the pages devoted to the branches of British administration to which they respectively belong. The land revenue system was *zamindari*. Land was let to a zamindar for a definite period, usually a year, on an agreement specifying the share of the produce which the zamindar was to pay to the government. This was generally two-fifths on land near the river or naturally irrigated, one-third or less on land watered by canals or wheels, and one fifth on waste lands requiring reclamation. These vague condition, left a good deal to be decided on the spot, and the work of measurement and appraisement gave employment to a very large number of Hindus, who thus rose to power and wealth. According to Lieutenant Hugh James, a party of these government revenue officers, "visiting a village as measurers and appraisers, caused far more domestic misery than would have been felt after a Belooch forray." In the case of crops other than grain the land revenue was recovered in cash, the rate varying as above according to the character of the land. There were also a number of additional cesses, the whole system, though simple in theory, being complicated in the working out of its details. But in the opinion of Lieutenant Postans it was upon the whole "milder and more equitable than might have been expected under an absolute government," and General John Jacob expressed the opinion that the first effect of British rule was rather to increase than decrease the burden of the cultivator. The worst effects of the Mírs revenue system arose from the very general practice of selling their rights to a contractor for a fixed sum, in order both to forestall their income and save themselves the trouble of collection. The contractor, supported but not restrained by the power of the government, wrung the uttermost farthing from the cultivator, who had no appeal.

The administration of the country was entrusted to Kárdárs in charge of the different districts, who were both revenue and

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judicial officers. The law which they administered was the Koran as interpreted by accredited doctors. The Mírs, though avaricious and bigoted and narrow, were not cruel. Their rule exhibited a striking contrast to that of their predecessors in the absence of political assassinations, and in the administration of ordinary justice they had an aversion to capital punishment. Mutilation was the penalty for the worst crimes, and this was commuted to prolonged imprisonment in the case of the privileged classes. Other punishments were fines, shaving the beard, blackening the face, flogging and confinement in the stocks. There were no proper jails, nor was any provision made for the subsistence of prisoners: that was the concern of their relatives or the charitable public. Trial by ordeal was allowed. The unwritten law of the Baluch, which allows a husband to kill his wife for infidelity, prevailed generally. The police department consisted of a few miserable sowars at the chief towns; but where every man carried arms and defended and also avenged himself, policemen were superfluous. For the detection of crime they had an excellent system, the abolition of which under British rule was regretted by many officers. The liability for all stolen property rested on the village or estate in which the theft occurred until the footprints of the thief were traced to another, in which case the liability was transferred to that village or estate. Thus it became the interest of every zamindar to see that he harboured no thief within his limits.

Capital offences were decided by the Mírs in person, who also heard appeals against the decisions of their kárdárs in the cases judged by them; but it was generally stated that both plaintiff and defendant had to pay highly for a hearing and still more for a verdict. But Mír Ghulám Alí was an exception noted for his love of justice.

The rule of the Mírs had the merit of strength. Lawlessness and raiding were checked and life and property were secure to a degree which had been unknown probably for centuries. Lieut. James, reporting on the district of Chanduka in 1846, says, "Thefts were scarce, much scarcer than they have been under the British Government." Abroad Sind was feared, if hated; but the policy of the Mírs was to avoid intercourse with other states, excepting Kalát, with the ruler of which they were connected by marriage. In their private life they kept up the primitive simpli-

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city of their race, especially in Hyderábád, and according to Dr. J. Burnes, who had better means of knowing than any other Englishman, their temperance was remarkable. The mention of spirits was offensive to them and not a hookáh was to be seen at their court, nor did any of the family at that time eat opium. With two exceptions they were of the Shía sect, unlike Baluchis in general, and they were very strict in the observances of religion. In their dress there was no gaudy show, "none of that mixture of gorgeousness and dirt to be seen at the courts of Hindu princes," but a most gratifying taste in dress and attention to cleanliness. In their manners they were haughty and reserved, yet courteous and in the exercise of true Baluchi hospitality extravagant. The splendour of their court amazed our early envoys. Their only personal extravagance was the indulgence of a passionate love of jewellery and fine swords, daggers and other arms. They had agents in Persia to seek for these and secured many historic blades of fabulous value. They had also induced skilful gunsmiths and inlayers to settle in Hyderábád. Every visitor to Sind before the conquest noted their passionate devotion to sport, to which they willingly sacrificed almost every other interest, enclosing large tracts of the most fertile country to make *shikárgáhs*, or game preserves, regardless alike of the loss of revenue to themselves and of the hardship to their subjects.

At the beginning of the 19th century the Mírs of Sind were reputed to be very wealthy. Their annual revenue was estimated at about 50 lakhs. Just before the conquest, however, it was computed not to exceed 35 lakhs. The hoarded wealth at Hyderábád, as has already been said, disappointed expectations.

THAR AND PARKAR.

It is necessary here to say a word about the Desert, which up to the time of the Talpurs had little share in the history of Sind and no annals of its own. The nomadic herdsmen who wandered over it, the petty chiefs of its scattered villages and the bands of raiders who found a refuge in it were not easily brought under any regular authority. It was a no man's land, where every one did that which was right in his own eyes. The dominant race prior to the time of the Talpurs was a tribe of Rajput origin named Sodha, which recognised two chiefs, the Ránas of Umarkot and Nangar Parkar. According to their own tradition the Sodhas invaded the desert from Ujjein about A. D. 1226 under a chief

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named Parmar Sodha. At that time the Súmras were in power and there were frontier forts at Umarkot and Rattakot commanding the routes across the desert. These Parmar managed to take and established himself as a Rána. His descendants, or successors, appear to have retained a virtual independence for centuries, always acknowledging of course the authority of the Emperor of Delhi when he chose to assert it. It was a Sodha Rána who offered an asylum to the fugitive Humayun at Umarkot in 1542. But in 1739 we find Nur Muhammad Kalhora shutting himself up in Umarkot and defying Nadir Shah, after which time we hear no more of a ruling Rána there; and it was from the last of the Kalhoras that the Nawab of Jodhpur bought the fort. The Talpurs regained it in 1813 and then set themselves to bring the whole desert under their authority, building solid forts of brick and lime at Mithi, Diplo, Islamkot and other places. By the time of the British conquest they were levying land revenue and transit dues on merchandise as far as Virawah and Nangar Parkar, where at some time not ascertainable a separate Rána had established himself. But there was not much revenue to be raised in these parts, for the desert had now become a wasp's nest, from which bands of marauders raided Cutch, Kathiawar and Gujerat as far nearly as Ahmedabad. The Mirs being confessedly unable to restrain them in accordance with the Treaty of 1820, a squadron of Bombay Cavalry and some Cutch Irregulars were posted in the Nangar Parkar District, under the control of the Political Agent at Bhuj, with excellent results. Subsequent events may here be so far anticipated as to say that, when Sind was conquered, steps were taken to administer Thar and Párkar from Hyderábád, but the principal men went in a body to Colonel Roberts, the Resident at Bhuj, and begged that they might be allowed to remain subject to him. So the district remained under the Assistant Political Agent as Deputy Collector, excepting the Umarkot and Nara Sub-divisions, which were incorporated in the Hyderábád Collectorate. Ten years later it was proposed to cede it to the Rao of Cutch, but again the people and the chiefs entreated that they might not be *sold* to anybody, but left subject to Lieuenant Raikes, the Assistant Political Agent. In 1856, however, the district was finally incorporated in Sind. By the more regular system of administration that followed this change the Rána and some Zamindars lost a measure of the power which they used to

enjoy and they roused the Kolis to revolt. On 15th April 1859 they attacked the Telegraph Office and Treasury and, after killing some of the Police Guard, got possession of the town. Part of the 3rd Baluchi Regiment from Hyderábád, some artillery from Karáchi, 600 of Lieutenant Tyrwhitt's Police Levies from the north and a small force from Deesa converged on the spot at once and, under the command of Colonel Evans, took Nangar Parkar on the 3rd of May and soon scattered the insurgents. The Rána and principal ringleaders, after living a fugitive life among their brotherhood in the neighbouring states for nearly a year, surrendered and were tried for sedition. The Rána was sentenced to 14 years transportation and his minister to 10, and many of the chief men lost their *jagirs.* After that there was no further disturbance. In the Mirpur Deputy Collectorate also there was a spirit of mutiny in 1846, for which there was held to be more excuse. The Sodhas, who were the chief malcontents, were invited by Government to make a statement of their grievances, of which the following is a brief outline. They contended for their right of levying a tax of Rs. 26½ on every marriage among the Kirar Banias and a fee of one rupee's worth of cloth for enforcing debts due to that caste, of receiving food when travelling from Banias without any payment, and of being supplied by that caste with bedsteads and coverlets. They also claimed a share in the Umarkot customs receipts and complained that their rent-free lands had been partly taken from them. As it appeared that these feudal rights had not been taken from them by the Talpur Mirs, they were allowed to retain some and granted compensation for others, and the disturbance ceased.

BRITISH ADMINISTRATION OF SIND.

On the annexation of Sind, Sir Charles Napier was appointed Governor of the Province on Rs. 8,000 a month and at first made Hyderábád his headquarters, but afterwards removed to Karáchi, where he built a bungalow which is still Government House. His administration soon became a subject of controversies almost as violent as his conquest. Sir Bartle Frere, who had the best opportunity of estimating it, stated that he had no hesitation in placing Sir Charles in the foremost rank of the Indian statesmen whom it had been his good fortune to meet, and added, "If all the useful and remunerative public works he projected were carried out, there would be work for his successor in Sind for many years to come." But these works were only

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at the enmity between the two departments. "While the police inform us of the cheating of the Kárdárs, Umbardars and Zamindars, these people complain of the usual faults of policemen, namely overbearing insolence. In this manner they keep each other in check and both take the part of the poor, not out of humanity but spite."

The Napier Mole, as has already been said, is the great memorial of Sind's first Governor. He had many plans for Karáchi harbour, but the rest were not executed in his time. He also predicted that Karáchi town would in time be transferred to Kiamari, but that has not come about either. He had many difficulties to contend with, having contrived to arouse a spirit of hostility in every authority with which he had to deal. The elements also seemed to be against him. Malarious fever or other sickness in December 1843 prostrated two-thirds of his troops, and cholera broke out at Karáchi in June 1846 and carried off 7,000 people in a week, among them John Napier, his nephew, who lost a child and was buried in the same grave with it. Locusts destroyed a season's crops and the river nearly destroyed another. These calamities could not subdue his fiery spirit; nor could age, illness and the effect of old wounds; but they hampered his work.

It is evident, however, that military rather than civil affairs had the first claim on Sir Charles Napier's attention. The country quieted down very quickly, for he made himself a terror to his enemies, while his generosity to those who submitted attached the Baluchi chiefs at first to the British rule. But he had 15,000 troops in the Province and he believed that it was menaced by grave dangers on all sides. Accordingly he occupied himself with strategic dispositions, forts and fortifications and occasional military demonstrations. He projected a bridge over the Indus at Sukkur on the plan of the one thrown across the Rhine by Julius Cæsar and built an Arsenal in Bukkur. He intended to surround Karáchi with fortifications sufficient to resist any Asiatic power, but this was fortunately one of the schemes which were obstructed. Then the Baluchi tribes on the frontier, who had been quieted before the conquest, became so troublesome again that Sir Charles determined to conduct an expedition against them in person. A fort had been built at Lárkána, where the newly formed camel corps, of which such great things were

expected, was stationed, detachments of cavalry had been posted at Khairo Garhi, Rojan and Khangur, and there was a whole brigade at Shikárpur; but the plunderers eluded them all and ravaged the country. No honest man's life was safe. So in January, 1845, Sir Charles crossed the frontier, with Generals Hunter and Simpson and a force of more than 6,000 men, to punish them in their own strongholds. Ali Murad co-operated with 4,000 Baluchis. The Bugtis of the hills escaped, but the expedition was so far successful that the Jakhránis and the Dombkís surrendered with their redoubtable chief, old Bijar Khan, who thereafter remained till his death a prisoner with Mir Ali Murad. Sir Charles then, following the policy of Nebuchadnezzar, removed the two tribes from their own country and settled them about Janadera in the Upper Sind Frontier District, where he hoped they would reform and become peaceful husbandmen. But their removal from the Kachhi plain only cleared the way for the Bugtis, who resumed their depredation and at last grew so audacious that they came down in force, 1,500 of them, to within 15 miles of Shikárpur, laughing at the terrified garrisons of the frontier forts, and carried off 15,000 head of cattle. A regiment of Bengal Cavalry sent in pursuit was afraid to attack them. This was too much. In January 1847 the Sind Irregular Horse, then stationed at Hyderábád, was ordered to the frontier under Captain John Jacob, who made his headquarters at Khangur, a dirty little hamlet of half a dozen huts and 24 souls, but destined to become Jacobábád, and thence he proceeded to apply his methods to the disorder. These, it need scarcely be said, consisted of a reversal of almost everything that the Governor had done. Captain Jacob laid down some great principles, *e. g.*, 1. To act always on the offensive. 2. To treat robbery and murder as equally criminal whether the victim was a British subject or not. 3. To consider blood feud an aggravating circumstance as proving deliberate malice. Sir Charles Napier had used one tribe against another and in particular outlawed the Bugtis, putting a reward of Rs. 5 each on their heads. A man brought a sack with two heads to Captain Jacob, expecting 10 rupees, and got 24 lashes. All forts were now abandoned and the Sind Horse, a corps practically raised, equipped and trained by Jacob himself, were set to patrol the whole frontier incessantly in small parties, with orders to attack instantly any marauders with whom they might fall in, regardless

History. of numbers; which they did and were never withstood. At last, in an evil day, the Bugtis tried another incursion in force. They were intercepted by Lieutenant Merewether, one of Captain Jacob's staunchest henchmen, with 130 of the Sind Horse. Refusing quarter, 600 of them were cut to pieces and over 100 taken prisoners: two escaped. This completely broke the tribe. The surviving leaders came in and surrendered at discretion and the tribe has given no trouble since. Its chief, Shahbáz Khan, is now a Nawab and a K. C. I. E., and when the Prince and Princess of Wales visited Karáchi in 1906, his majestic presence among the spectators so struck Her Royal Highness that she turned aside to address a few words to him and was overheard to say that she would like his photograph. Captain Jacob had in the meantime discovered that the most regular raiders on the frontier were Sir Charles Napier's reformed settlers, the Dombkis and Jakhránis, whom the officers in charge of the district had never suspected. Sir Charles trusted no man, but he thought that he had crippled them by ordering all their horses to be sold. But each horse was owned by a syndicate, and when the nominal owner parted with it its usefulness to the tribe was not affected. Captain Jacob now obtained orders to disarm the whole population. At the same time he cut roads through the dense jungles on the right bank of the Indus, in which the robbers had often found secure refuge. The effect of his measures are best exhibited by contrasting the state of things in the Northern Sind Frontier District in 1846 and 1851. In the former year, "Everywhere were desolation and dismay; there was no security for life or property; irrigation was neglected, the canals were choked and consequently cultivation had almost ceased. The British garrisons, shut up in the mud forts, looked on in impotent inaction," (General John Jacob, by A. I. Shand.) In 1851 Mr. Frere wrote, "Single unarmed travellers seemed now as safe as elsewhere in Sind and the general sense of perfect security was shown by the improving state of the villages, and the fact that the people now trust themselves, their cattle and grainyards, day and night, out in the open fields."

In the winter of 1845-46 civil affairs were again interrupted by the First Sikh War, to assist in which Sir Charles Napier marched to Bahávalpur with 12,000 troops, while 20,000 more were held in readiness in Sind. In the following year he resigned his appoint

ment after penning an alarming forecast of the doom of Sind if it should be handed over to a costly and incompetent civil administration. In October 1847 he left Karáchi under a salute fired from the farthest point on his own mole to which wheels could at that time proceed, at which point, after his death in 1853, the Karáchi public erected an obelisk that, in its utter meanness, seems to be an architectural application of the art of "damning with faint praise." They also gave him a memorial window in Trinity Church, which was blown to pieces by the cyclone of 1902.

A civilian administration had already been decided on and Mr. Pringle of the Bombay Civil Service was appointed Commissioner in Sind, subordinate to the Bombay Presidency. Perhaps the antidote was rather strong, for Mr. Pringle was emphatically an "old Indian" and came direct from the Secretariat. At any rate there were causes of dissatisfaction and he resigned in 1850, but in the meantime large reforms had been inaugurated. Immediately after Mr. Pringle's appointment Sir George Clerk, Governor of Bombay, had visited Sind and personally investigated the whole machinery and methods of its government. His exhaustive minute on the subject should be read as a corrective to General William Napier's book. The amount of the revenue could not be ascertained, but the expenditure was extravagant, the collection of the land revenue was practically in the hands of the Kárdárs, whose exactions there were no means of controlling, Sir Charles Napier's confidential *Munshi* had remitted to Bombay, in the names of others, sums amounting to Rs. 99,902, losses in the Commissariat Department by swindling Parsee contractors were estimated at 6 lakhs of rupees, there was no official list of Jagírdars, nor had their titles and claims been settled, the machinery of civil justice was good, that of criminal justice bad, the canals had deteriorated and the government forests were being recklessly destroyed. Reforms were introduced on the lines indicated by Sir George Clerk. Military Commissions were entirely abolished and criminal and civil justice was committed to four grades of courts, those of the Kárdár, Deputy Magistrate, Magistrate and Commissioner. The Commissioner was given a Judicial Assistant. A seven years' revenue settlement had been made in the year of Mr. Pringle's arrival, based on a cash payment equivalent to the share of the crops at assumed prices.

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The next civilian nominated for the Commissionership was so young (only 35) that the Council strongly opposed his appointment and the question had to be referred to England; but the Governor, Lord Falkland, knew Mr. Frere, who had already proved himself at Satára in the difficult times succeeding the annexation, and he made a personal matter of it and carried his point. The event proved his sagacity, for it is impossible to exaggerate the effect which the statesmanlike administration of Sind from 1851 to 1859 had on its future development. Mr. Frere possessed in an uncommon degree the gift of making it a pleasure to men of capacity to work under him, for, while he seemed to understand everything, he never interfered with the man at the wheel. He had another talent most valuable in those impecunious times, a marvellous skill in extorting money for his farsighted schemes. Lord Falkland called him "the importunate widow." The state in which he found the Province has already been described, without roads, bridges, or public offices. Service in Sind was very unpopular and even native artisans, servants and other immigrants from the Punjáb, Cutch and Bombay, loathed the country, not because of the heat or the distance, but because it was an "uncivilized, unimproved place, difficult to get at and difficult to get away from." Mr. Frere turned his attention to the port of Karáchi at once. A small lighthouse had been built and some buoys laid down, but little else had been done. No ship would attempt it during the monsoon and the post had to go at that season from Bombay to Sind by land, or rather, to speak more exactly, by mud. Mr. Frere wanted a proper survey of the mysterious bar, he wanted a pilot, he wanted a dredger. But simple *vis inertiæ* withstood him for two years. "It is uphill work," he writes, "officials pooh-poohing and throwing cold water, merchants turning up their noses at a commerce of which they have only a huckster's notions and dreadfully afraid, if they do believe there is any chance of any trade ever coming here, that the growth of a port 500 miles away and communicating with an entirely different region, will ruin Bombay." At last he wrote direct to Lord Dalhousie, who was alert for chances of developing India in any direction and also swift to act. Then the machine of Government began to move and a thorough survey of the harbour and coast was begun; but it was 1856 before the whole question of the improvement of the port was

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laid before Mr. Walker, one of the ablest harbour engineers in England, with results which are described in the article on the Port of Karáchi. Closely connected with the improvement of the harbour was a scheme for a railway from Karáchi to Kotri, for Mr. Frere had made up his mind that Karáchi and not Calcutta was to be the port of the Punjáb. He was already urging that the English mail steamers should go from Aden to Bombay *via* Karáchi in the monsoon. In March 1855 the Sind Railway Company was formed in London and work was actually begun in May 1858, but the railway was not opened till May 1861, when Mr. Frere had left Sind. In the meantime roads were spreading over all the country. Not that Sind has much need of the roadmaker; but it must be remembered that, wherever there were canals, the inundation stopped all land traffic while it lasted. So roads meant bridges. Major Jacob was making these at the rate of 15½ *per annum*, solid bridges of burnt brick, with mud cement and semi-circular arches, all made without the assistance of a single European, or even a native trained in a European office. A carriage road over the Laki hills was, however, a piece of real and most necessary road-making carried out at this time. Traveller's bungalows followed the roads and supplied a crying want. Another pet scheme of Mr. Frere's was an annual fair at Karáchi to bring together the dealers of Central Asia and Bombay. The first was held in December, 1852, and they continued to flourish till the old methods of trade passed away. Mr. Frere's original postal arrangements must not be omitted from mention, for he was the introducer of the postage stamp into India. It had been a postulate of administrative science that "prepayment by stamps may do very well in Europe, but will never do in India." But Mr. Frere held that post offices were not luxuries but necessities: he had too few of them and could not get money out of Government for more. So he designed, with the aid of Mr. Coffey, the resourceful Postmaster of Karáchi, a stamp bearing a modified broad arrow and the words "Scinde District Dawk," and distributed it for sale. Orders were then given to every Police officer and district official to receive all letters bearing these mystic "tickets" and forward them with his official budget to his superior, who in turn was to pass them on till they could be delivered to a regular post office. Thus every Government office

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in any department became a letter box, and a cheap and efficient postal system was established over the whole Province. This is the origin of the Sind Stamp in three colours, the present catalogue values of which are 15, 25 and 80 shillings. They were abolished in September, 1854, on the introduction of Indian stamps. Education very soon received Mr. Frere's attention when he found that there were only two European officers in Sind who could speak Sindhi. He wanted to make the language of the people the official language too, but this could not be done if his officials could not speak it and nobody could write it. For up to this time the language was for common purposes unwritten, possessing no adequate character. How these difficulties were overcome is narrated in the article on Education. Suffice it to say here that Sindhi, written in a character adapted from the Arabic, became the language of official correspondence and that promotion in the civil service was made conditional on at least a colloquial knowledge of it. Within five years of his arrival in Sind Mr. Frere was able to report that twenty-five of the European officers were using it regularly in their courts. Schools were established in the principal towns at the same time. The first Government English School in Karáchi was opened in 1853. The foundation stone of Trinity Church had been laid the year before and it was finished in 1855.

Early in 1856 Mr. Frere's health failed and he was forced to take a year's furlough. At his request John Jacob was appointed to act for him and he took the opportunity to abolish forced labour, which had been employed since the time of the Mírs for the clearance of canals. Frere returned to Karáchi on the 18th of May, 1857 and on his way from the landing place to Government House received a private letter announcing the mutiny at Delhi. Within two hours he was urging the General Commanding the troops in Sind to send up European soldiers to Multán to strengthen the hands of Sir John Lawrence, and his conduct through the trying months that followed fully entitle him to a place among the handful of men who saved India at this crisis in the midst of so much helpless incompetence. Jacob was engaged in the Persian War, with one of the two regiments of Sind Horse. The force in Sind consisted of the 1st European Fusiliers, the Depôt of the 2nd (300 men), four Bombay Native Infantry Regiments, a Baluch Battalion, one regiment of Sind Horse, the

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6th Irregular Bengal Cavalry and two Batteries of Native Artillery. But Frere took upon himself the responsibility of despatching, as fast as they could be got away, a wing of the 1st Fusiliers and the Baluch Battalion. Afterwards he sent more Europeans to Bombay at Lord Elphinstone's request, and Sind was left with less than 500 European troops in charge, of whom 150 were invalids or inefficient. Of course there was alarm in Karáchi. The residents wanted to form volunteer bands. Mr. Frere told them to remain in their own houses, calm their families by reason, religion and example, and in case of any disturbance to defend their homes with such arms as they could use till aid should arrive. He wrote about the time of the Muharram festival to Lord Elphinstone. "It is dangerous to go near the houses of Parsees and English clerks after dark, for the inmates are armed to the teeth and apt to explode like a box of rockets." A "disturbance" was not long of coming. On the evening of 8th September seditious meetings were reported among the Native Artillery in Hyderábád. The ladies were at once moved into the fort and the guns were taken possession of by the European soldiers and afterwards handed over to a body of Volunteer Artillery which had been formed from the European troops in the Depôt at Karáchi in view of such a contingency. The mutineers were promptly tried, found guilty and executed. Five days later, on the 14th, at 2 o'clock in the morning, Frere being at Clifton, Captain "Bob Johnstone" rode up and told him quietly that the 21st Native Infantry had mutinied. Just before midnight a Subadar had informed the Officer Commanding that they were preparing to rise at 2, stir up the 14th, murder the Europeans and march for Delhi. Mr. Frere made all the haste he could, but before he reached Karáchi the danger had been grappled with. The Volunteer Artillery, with eight guns and two hundred other European soldiers, had been marched, swiftly and almostly silently, to the parade ground of the 21st, where the assembly was sounded. The sepoys fell in, greatly discomfited, and, being ordered to pile arms and move away, did so. The muster roll was then called and it was found that thirteen had their muskets loaded and twenty-one were missing. Parties of Police went out in pursuit of the latter and, aided by the country people, accounted for all but four. They were formally tried, with the aid of a native court, and, with a few exceptions, hanged or blown from guns, on the plain in sight

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of the barracks, where the Empress Market now stands. On the 20th of the same month an attempt at Jacobábád was cleverly nipped in the bud by Merewether and this brought about the miscarriage of a much more serious plot at Shikárpur, in which some petty Baluch chiefs were involved. No class of the people of Sind showed any sympathy with the mutineers.

In December of next year, 1858, General Jacob broke down at last, brain and body giving way under the remorseless strain that he had put on them. He was with difficulty persuaded to come into Jacobábád, where he rapidly sank till he passed away at midnight of the 5th, in the midst of a mingled circle of British officers, troopers of the Sind Horse, envoys from Kalat and wild but weeping Baluchi chiefs. He was buried, according to his own wish, without pomp: no volley was fired over his grave. But it became a shrine from which the Baluchis believed that his spirit still watched them.

One important event of Mr. Frere's time remains to be noticed. After the battle of Miani all the lands of the Mirs were confiscated, with the exception of those which belonged to Alí Murád of Khairpur by inheritance and those which had belonged to Mir Rustam personally and in right of the turban, which were now conferred on Alí Murád as a consequence of the recognition of him as the *Rais* of Khairpur. Just before Sir Charles Napier left Sind he received information that the latter had contrived to add considerably to the extent of the territory of which he was thus left in possession by a daring forgery on a leaf of the Koran, which he had inserted into the treaty of Naonahar mentioned at page 126. The matter was inquired into by a special Commission in 1850, during the Commissionership of Mr. Pringle, and the guilt of Alí Murád was established beyond a doubt. It was not until the end of 1851, however, that the decision of the Court of Directors was received. It was that Alí Murád should be degraded from the position of *Rais* and deprived of all his lands except those which he inherited under his father's will. The territory of which he was deprived by this sentence measured about 5412 square miles and included the *parganas* of Kandiáro and Naushähro, now part of the Hyderábád District, and Burdika, Shahbela, Chak, Saidabad, Ubauro and Mirpur, with the Alor, Bukkur and Bamburki Tapas, which were all incorporated in what was then the Shikárpur District. The severity of the sentence

excited a good deal of sympathy on the part of the Europeans in Sind, among whom Alí Murád had become exceedingly popular, and he was encouraged to hope for a reversal, or at least a revision, of it by a well known Irish M. P., and even made a journey to England to urge his claims. The hope proved vain, but after a time his salute of 15 guns (since increased to 19) was restored to him and he was invested with first class jurisdiction over his own subjects.

In May 1859 Mr. Frere was made a K. C. B. and a few months later appointed to a seat on the Viceroy's Council. Before he left, a meeting of the Karáchi public was held to consider how they should put on record for posterity their estimate of the debt which the whole Province owed him. The result was the Frere Hall, elsewhere described, which was opened in October, 1865.

Sir Bartle Frere was succeeded by Mr. J. D. Inverarity of the Bombay Civil Service in October, 1859. Many reforms in the Revenue, Judicial and other Departments were effected under him, but the progress of the Province from this time forward was the normal development of a regular administration and comes under notice in the chapters devoted to the various departments of it, to repeat which here would be waste of time and space. The commencement of the Mithrao Canal, the advancement of education and extension of municipalities, the establishment of a department for Indus River Conservancy, the opening of the Karáchi-Kotri Railway and, last but not least, the founding of the Karáchi Chamber of Commerce, mark the Commissionership of Mr. Inverarity.

Mr. S. Mansfield, B. C. S., succeeded him in 1862 and remained until 1867. The most important event of his time was the introduction of the Sind Courts Act, whereby the highest judicial functions were separated from the Commissionership and committed to a separate Judicial Commissioner. The next Commissioner in Sind was no other than that Lieutenant Merewether who, as John Jacob's right hand, had won so much distinction on the Upper Sind Frontier, the same who nearly exterminated the Bugti raiders on that fatal day. He was now Sir William Merewether, K.C.S.I., C.B., and was engaged in the Abyssinian war, but Mr. W. H. Havelock, B. C. S., held the appointment until his arrival in July, 1868. He remained until Septe nber, 1877, and the Merewether

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Clock Tower, of which the foundation stone was laid by Sir James Fergusson in 1884, is a fitting memorial of his long rule. The succeeding Commissioners have been :—

Mr. Francis Dawes Melvill, from 12th September, 1877, to 6th June, 1879. From 1st June to 8th August 1878, Mr. J. B. Peile acted for him during his absence. The Railway from Kotri to Sukkur was opened in October, 1878.

Mr. Henry Napier Bruce Erskine, from 7th June, 1879, to 13th April, 1887. Mr. Peile acted again from 2nd January to 31st March, 1881. During Mr. Erskine's rule Sind was visited by three Governors of Bombay and His Royal Highness the Duke of Connaught. Sir Richard Temple came in 1880 and laid the foundation stone of the water works reservoir at Karáchi. Sir James Fergusson laid the foundation stone of the Merewether Tower in 1884, and also of the Empress Market; and Lord Reay opened the Dayaram Jethmal Sind College in 1887. H. R. H. the Duke of Connaught visited Sind in 1887 and the opportunity was taken to ask him to lay the foundation stone of the Victoria Museum.

Mr. (afterwards Sir Charles Bradley) Pritchard, from 14th April, 1887, to 17th May, 1889. His Excellency Lord Reay opened the Lansdowne Bridge over the Indus at Sukkur on 27th March, 1889.

Mr. (afterwards Sir Arthur Charles) Trevor, from 17th May, 1889, to 22nd May 1891. During his absence from 20th November, 1890, to 19th February 1891, Colonel E. W. Trevor acted for him.

Mr. (afterwards Sir Henry Evan Murchison) James, from 20th June, 1891, to 18th December 1900. He was absent on leave, or special duty, several times, during which Sir Charles Ollivant, Sir Andrew Wingate and Mr. Robert Giles acted for him. In his time three Governors of Bombay visited Sind, Lord Harris twice, in 1891 and 1894, Lord Sandhurst three times, in 1895, 1898 and 1899, and Lord Northcote in 1900. It was when Sir A. Wingate was acting Commissioner in Sind, in 1896, that plague appeared first at Karáchi.

Mr. Robert Giles, M.A., C.I.E., from 18th December, 1900, to 1st April, 1902.

Mr. A. Cumine, C. S. I., from 1st April, 1902, to 14th December, 1903, when he proceeded on leave from which he did not return. Mr. Horace Charles Mules held the appointment until the arrival of Mr. John William Pitt Muir-Mackenzie, M. R. A. C., on 3rd March, 1904. He left on 31st March, 1905, and Mr. William Thomson Morison acted as Commissioner till November, 1905, when Mr. Arthur Delaval Younghusband took charge of the appointment. Under his auspices this Gazetteer was published. **History.**

In 1906 Karáchi had the distinction of being the port at which T. R. H. the Prince and Princess of Wales closed their Indian tour and embarked for Europe. They arrived on 17th of March and in the afternoon of the same day H. R. H. the Prince unveiled the statue of H. M. the late Empress Victoria in front of the Frere Hall. On the evening of the 19th Their Royal Highnesses drove to Kiamari, where they were received by the Chairman and members of the Port Trust Board and embarked at the Merewether Pier on board H. M. S. "Renown."

CHAPTER IV.

POPULATION.

TABLES I, IV, V & VI.

CENSUS FIGURES.

The census of 1901 showed that the people of Sind numbered 32,10,910, having increased by 3,35,810 in the preceding ten years and by 10,04,345 since the first regular census was held in 1872. Divided by sex the population showed 17,61,790 males and 14,49,120 females. This disparity has existed as far back as records go and has never been satisfactorily explained. It is found among Musalmans as well as Hindus. Divided by religion the population consisted of 24,46,489 Musalmans, 7,51,252 Hindus, 921 Jains, 7,817 Christians, 2,000 Zoroastrians, 428 Jews and 2,003 "Others." Briefly we may say that ¾ of the people of Sind are Musalmans and ¼ Hindus, other faiths being a negligeable quantity. It must be noted, however, that there are no Sikhs in the returns for Sind, nor any "Animists," so prominent in some census reports. It appears from this that professors of the Sikh religion and also the many thousands of Bhils and other aboriginals in eastern Sind have on this occasion been classed as Hindus.

DISTRIBUTION

Hindus and Musalmans are not equally distributed through the Province. In Thar and Párkar there are nearly 3 Hindus to every 4 Musalmans, in the Upper Sind Frontier District about 1 to 10. The numbers of the more important Musalman races, or tribes, or castes, are Samas 7,85,816,* Baluchis 5,57,733, Arabs (*soi-disant*) 1,22,041, Muhánas 1,07,383, Súmras 1,02,753, Jats 77,920, Brahuis 47,345, Patháns 23,061 and unspecified Sindhis 6,11,158. The Baluchis are few in Thar and Párkar, but generally distributed elsewhere; the Brahuis most numerous in Karáchi and the Upper Sind Frontier and about Shikárpur; the Muhánas and Jats almost confined to central and southern Sind and most numerous in the Delta; Samas and Súmras gathered into the fertile central districts; Arabs and Patháns resident in Hyderábád, Sukkur and

* This includes Mahars, Dahars and Chachars, separated in the Census Tables.

Shikárpur. The chief Hindu castes are the *Vánis* (including all Lohánas, whether Amil or Bania, and also Bhátias) 4,23,824, Dheds 70,678, Bhíls 36,157, Kolis 32,126 and Rajputs 26,197. The Brahmans number only 13,376 and are sadly insignificant. The *Vanis* and Brahmans are generally distributed, but the Rajputs and also the Dheds and Kolis, with other low caste Hindus, are found chiefly in Thar and Párkar and the adjoining parts of the Hyderábád District: they are all children of the east. Perhaps no part of India has a population of such mixed origins as Sind, but three of the principal elements may be separated with some distinctness. These are the Rájputs, the Baluchis and the Sindhis proper, including in the last term Jats and Muhánas. The Rajputs appear to have been the predominant race of the Hindu kingdom which Muhamad Kasim subjugated in 711 A. D. and they have never ceased to invade the province from the east. Recent head measurements support the view that they are a purely Aryan stock and probably the descendants of the Kshatriya, or warrior, caste of ancient Hindustan. The tribes of them which were in the country when the Arabs invaded it (*e. g.* the Samas and Súmras) became Musalmans centuries ago, but the more recent immigrants, such as the Sodhas, are Hindus still. The Baluchis who form the second element were the ruling race at the time of the British conquest, and for centuries before it had invaded the province constantly from the west. Between these two lies the third element, the sons of the soil, who remained and toiled and suffered while the east and the west contended for dominion over them. In them we may recognise the descendants of the ancient Hindu peasantry, or of the Scythian hordes who overran the country from the first century before the Christian era, or of these and other elements inextricably blended. They are all Musalmans now. Perhaps we should class with these the Lohánas, for that caste was certainly in the country when the Arabs came; but no one knows whether the present Lohánas of Sind are partly the posterity of such of them as contrived to evade proselytisation, or all later immigrants from the Punjab. Besides these three chief elements there are others plainly distinguishable, low caste Hindus and aboriginals from the east, of whom Kolis, Dheds and Bhils are the chief; tribes and families which, priding themselves on descent from the Arab conquerors, have nursed their genealogies and kept themselves distinct; Afghans and Mughals who came in

PRINCIPAL ELEMENTS OF POPULATION.

the train of some conqueror and remained; and many more. Notes on the principal tribes and castes which the census discovered to be domiciled in Sind will follow further on. More particular information relative to their distribution in the several districts will be found in Tables I and VI and introductory notes to those Tables.

MIGRATION.

Of the 32,10,910 people found in Sind on the Census night, 29,16,638 were born in the Province, leaving a balance of 2,94,272, or about 1 in 11. The following data of the principal birthplaces of these will give a fair idea of how the population of Sind is recruited from abroad:—

Baluchistán	64,913
Rájpútána	64,306
Cutch	51,779
Punjáb	31,631
Khairpur State	18,404
Afghanistan	10,625
North West Provinces	7,255
Kathiáwár	4,129
Goa	2,077
Bombay City	2,057
Central Provinces	1,937
Ratnágiri District	1,638
Europe	1,565

Of those from Baluchistán 26,554 were in the Upper Sind Frontier District, 24,002 in Shikárpur and 12,829 in the Karáchi District. The census was taken in January, at which time large numbers of the hill people of Baluchistán are down in the warmer plains, and there were canal works in progress, on which they could earn money. Those from Rájputána were mostly in Thar and Párkar and the Hyderábád District. They were also common labourers in quest of work. So were those from Cutch, but they were in Karáchi chiefly and also in the Hyderábád District, *i. e.*, the rice country of the Delta. When the rice was reaped they would return to their homes. The Punjábis were probably more permanent, having found good employment as boat-builders, wood-sawyers and also cultivators. The Afghans would mostly be traders and hawkers, or labourers, in Sind for the season only,

Corresponding data relative to the natives of Sind who were abroad at the time of the Census cannot be obtained; but it is evident that they were comparatively few, for in all the native states of the Bombay Presidency, including Cutch and Kathiawár, only 9,453 gave Sind as their birthplace. In Bombay city, however, there were 8,661. In the bazaars of Bokhára and Samarkand there were no doubt Banías born in Shikárpur, but they would not be very numerous.

CIVIL CONDITION.

The Census of 1901 showed that 51 *per cent.* of the people of Sind were unmarried, the percentage of males being 57 and of females 43. In the British Districts of the Bombay Presidency, excluding Sind, the corresponding figures were 39, 46 and 31. Celibacy is not esteemed in Sind more than in the rest of India and this remarkable difference must be assigned to two causes, (1) the great preponderance of Musalmans, among whom it is not considered a religious duty to be married as it is among the higher castes of Hindus, and (2) to the average age at which boys and girls are married being considerably higher in Sind. That the latter is the chief cause may be inferred from the fact that the disparity is greatest in the percentage of females, who do not in either community remain unmarried by choice.

INFIRMITIES.

The following figures, taken from the Census Report of 1901, show the prevalence in Sind, as compared with the rest of the Bombay Presidency, of the four principal forms of mental and bodily infirmity; and also the remarkable decrease under every head which each successive census has revealed :—

Infirmity.	Per 1,00,000 Persons.					
	Sind.			British Districts of the Bombay Presidency excluding Sind.		
	Total.	Males.	Females.	Total.	Males.	Females.
Insanes	36	42	28	18	24	12
Deaf Mutes	51	61	40	35	41	28
Blind...	91	97	83	89	86	89
Lepers	5	4	5	36	52	20

Statement showing total number of Infirm people in the Province of Sind:—

Year of Census.	Insanes.		Deaf Mutes.		Blind.		Lepers.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
1881	2,128	1,175	1,746	1,041	5,152	6,153	166	111
1891	1,608	835	2,008	986	3,277	2,878	125	84
1901	747	404	1,069	577	1,707	1,209	79	74

That the percentage of insane persons in Sind should be double that in the rest of the Presidency is, to say the least, remarkable. This and other questions raised by the Census returns are ably discussed in Mr. R. E. Enthoven's Report on them. No explanation which has been offered is quite satisfactory, but it may be mentioned here that the proportion of insane persons is always higher in the upper than in the lower castes and that the Indian religions stand in the following order with regard to the percentage of insanes found among the professors of them:—

Parsi,
Musalman,
Jain,
Hindu.

The enormous preponderance of Musalmans in the Province therefore affords at least a partial explanation, which may be strengthened by the fervid and fanatical character of the religion of a large section of the population. In the opinion of the writer the sun of Sind offers an adequate reason, if there were no other.

For the high percentage of deaf-mutes there is no explanation in the field. That the percentage of blind persons should be so little above that found in the rest of the Presidency is marvellous in view of the glare and dust and consequent prevalence of diseases of the eye. Sind has always enjoyed a remarkable immunity from leprosy in spite of the fact that its people are great fish-eaters. But they live more in the open air, owing to the absence of rain, than those of any other province.

The improvement under every one of the four heads is most remarkable and satisfactory, whatever be the explanation. In

part it may fairly be attributed to the great increase of the population by immigration, for immigrants do not usually bring their blind and dumb with them; but a large share of the credit must still remain for assignment to improved conditions of life, better medical treatment and, above all, vaccination and restriction of small-pox, so frequent a cause of blindness.

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ISLAM.

The essence of Mahomedanism lies in the simple creed, "There is one God and Muhammad is his Prophet." Subscription to this and the rite of circumcision constitute a man a Musalman. But the orthodox faith may be stated in a more expanded form as a belief in one God, in the government of the world by Him, in the preordination of good and evil *(takdir* or *kismat)*, in an ultimate resurrection and judgment, in the divine inspiration of the *koran* and in the efficacy of the Prophet's intercession (*shafáat*) on behalf of his followers. The practices enjoined upon a Musalman are circumcision, prayer with certain ablutions, alms, fasting, the pilgrimage to Mecca and abstention from unlawful flesh, gambling and usury. But many of these may be and are neglected without danger of exclusion from the house of prayer. In practice circumcision and abstention from unlawful flesh probably constitute the irreducible minimum. By the law of Islam known as *zakát* every individual possessed of property exceeding a small fixed value is required to contribute a certain part of his substance towards the support of his poorer neighbours. The mass of the Sind peasantry, though they may be acquainted with the cardinal articles of their creed, are careless or ignorant of its precepts; but upon the whole they strike a stranger as being more religious according to their lights than the Musalmans of almost any other part of India. They are also pre-eminent for abject devotion to *Pírs* and *Sayads*, living or dead.

SUNI AND SHIA.

The religion of Muhammad has been fertile in schisms. The first division, which is still the most important, was into those who held by the first three Khalifas, Abu Bakar, Umar and Usman, as the rightful successors of the Prophet, and those who regarded them as usurpers defrauding Ali, the cousin and son-in-law of the Prophet, of his right to the succession for 24 years. When Husain, the son of Ali and grandson of the Prophet, was killed in the bloody battle for the khalifate fought at Karbala in 680 A. D., those who held the latter opinion adhered to his posterity

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and got the name of Shia, *i. e.*, adherent.* The others submitted to the secular authority of the successful khalifa as Commander of the Faithful, and for spiritual authority fell back upon the written word and canonical tradition: hence they came to be called Suni, *i. e.*, "men of the path." They acknowledge six books of authentic tradition and four Imams, or doctors of the law, whose expositions may be regarded as authoritative, *viz.*, Abu Hanifa, Shafei, Malek and Hanbal, who lived in the eighth and ninth centuries. The Sunis of Sind belong generally to the school of Hanifa. It follows from their dependence upon a source of authority which is dead and immutable that they are more conservative than the Shias, being, in fact, precluded from adapting their dogmas or practices to changed conditions or advancing knowledge. There are many minor differences between the two sects which cannot be detailed here: they hate each other cordially and have always persecuted each other as they had the power. The great bulk of the population of Sind professes the Suni creed, but most of the Talpurs, the Mughals, Khojas, Borahs, a considerable proportion of the Kalhoras and some Sayads and Baluchis are Shias.

ISMAILI SHIAS. BORAHS.

Two divisions of the great Ismaili sect, an offshoot of the Shia, are found in Sind. The sect derives its name from the eldest son of Jafar Sadik, the sixth Shia Imam, whose claim to the succession was repudiated by the main body on the ground that he had predeceased his father. A minority adhered to his posterity. In the 11th century, according to the received tradition, an Ismailian missionary, landing at Cambay, made many converts among the Brahmans and traders of Gujerat, whose descendants are known now as Borahs. On the occurrence of the dispute concerning the succession to the Fatimide Khalifate in Egypt, which in 1094 divided the Ismailians into two factions, the Mustaalian and the Nizarian, the Borahs sided with the former, if indeed their conversion had taken place at that time. The line of their Imams practically disappeared after the fall of the Fatimide khalifate in 1171 A. D. and in 1588 the main body of Gujerat Borahs severed

*The Shia Imams are:—1. Ali the fourth khalifa 656-661; 2. Hassan d. 671; 3. Hussen d. 680; 4. Zenulabdin d. 713; 5. Muhammad Bakir d. 731; 6. Jafar Sadik d. 766; 7. Musa Kasim d. 802; 8. Ali Reza d. 824; 9. Muhammad Taki d. 836; 10. Ali Naki d. 866; 11. Hassan Askari d. 874; 12. Ali Mahdi d. 880. Shias believe that Ali Mahdi disappeared in a grotto in his twelfth year and that he is still alive, and they look forward to his reappearance to establish the universal khaliphate.

their connection with the Ismailian community in Arabia and elected a high priest of their own named Daud, whence they been known since that time as Daudis. All Sind Borahs are Daudis. Borahs conform to the ordinary Shia observances and are strict in their religious duties, though some of their views are unorthodox. **Religion.**

KHOJAS.

In 1430 A. D. Pir Sadrudin, a missionary of the other, or Nizarian, branch of the Ismaili Shias, came to Sind and Gujerat and, with the assistance of a learned and influential Brahman, who is said to have largely Hinduised his teaching, made many converts among the Lohánas, who acquired the name Khoja (spelled Khwajah in Persian and apparently a title of honour). Sir R. Burton thinks that the Khojas of Sind are descendants of refugees from Persia and no doubt there is an admixture of this element among them and among the Borahs. Holding doctrines introduced among the Nizarians by Hasan Sabah, the "Old man of the Mountain" and chief of the sect of "Assassins," and also a theology compounded in India which admits the nine incarnations of the Hindu Vishnu and makes Ali a tenth, the Khojas are regarded as utterly heterodox; but they are Shia Musalmans, repeating in their prayers the names of the 6 Imams common to all Shias and of 43 more, down to that of H. H. Aga Khan, their present living Imam, whose grandfather, Aga Shah Hasan Ali, came to Sind from Persia in 1842. But they do not regard the Korán with orthodox reverence, using instead a manual prepared by Pir Sadrudin and written in the "Khoja" character, which is the character still employed by Khojas in business. Khojas wear the moustache, but shave the chin, contrary to Muslim rule. They follow the Hindu law of inheritance and many Hindu customs. The Khoja community contains two sections, a schism having commenced among them about 50 years ago. A minority, partly of those whose views had been modified by long subordination to persecuting Suni rulers and partly of other elements, seceded from the main body and repudiated the authority of the Aga Khan first in Bombay and then in Karachi. The movement resulted in law suits for the possession of places of worship, burying grounds and other property, and has resulted in much bitterness of feeling and some murders. In Sind the chief point of disagreement was the practice

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of making *tábuts* at the Muharam, into which the Khojas had fallen though it is quite contrary to the traditions of the sect. When H. H. the Aga was appealed to about 30 years ago and decided against the practice, a minority refused to obey and got the name of *Pirái* from *Pir* (which has no connection with *Pír*, a saint), the ordinary name for a yard in which *tábuts* are set up. The majority retained the name of *Panjbhái*, which means Brother of the Hand (from *Panj*, the five fingers) and signifies a fellowship, or communion. It was not till a few years ago that the long quarrel between these two parties ripened into an actual schism, which excluded the *Piráis* from the Khoja sect. Outside of Karáchi the two parties generally continue in the same community and even intermarry.

ZIKRIS OR DAIS.

Among the Makranis of the Karáchi District are a number of adherents of this strange sect, who may be classed as Musalmans inasmuch as they read the Koran. They do not regard Muhammad, considering that he has been superseded by the Mehdi whom they follow. This, according to tradition, was one Rahmat, or Dost Muhammad, who produced a new book from under a tree near Turbat in Makran, whither his followers now go on pilgrimage instead of to Mecca. They do not pray nor fast, but meet every Friday to repeat their *zikr*, whence their name. Their *zikr* is different from that of orthodox Mahomedanism and the ceremony is said to be accompanied by ribaldry and immorality. They treat their *Mullas* with idolatrous reverence.

SUFISM.

The mystic doctrines of the Sufi sect are followed by an uncertain number not only of Musalmans, but also of Hindus, who do not on that account abandon the practices of their own religion.

HINDUISM.

Hinduism has no Prophet, no Creed, no Book, and its outward aspects are so numerous and varied that it is impossible to define the religion. Outwardly a pantheism in which the worship of the Creator is completely obscured by an idolatrous ritual, it retains the conception of a Supreme Being, who is alluded to as Bhagwán, or Parameshwar, but who is regarded as having no concern in the affairs of men and in whose unconditioned existence it is the hope of every Hindu to be ultimately merged. Worship must be directed to the attributes of God on which the mind can be fixed and which present themselves as concrete manifestations of

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deity. The gods, or demons, of the non-Aryan races have been absorbed into the system and identified with one or another of these manifestations, without much change in the symbols (idols) which represent them, or the rites by which they are propitiated. It is with reference to the particular manifestation, or its symbol, which each selects as the special object of its adoration that the various sects of Hinduism are classified.

Since the Vishnuite revival of the 12th century these sects have ranged themselves in two hostile camps, namely, the *Vaishnava*, or worshippers of Vishnu, the Preserver, and the *Shaiva*, or worshippers of Shiva the Destroyer. These are sub-divided according to the reformer, or teacher, whom they follow as their guide. Brahma, the Creator and first person of the trinity, is conceived of as a being not approachable by human worship, being in fact the Supreme Being above mentioned. The three chief divisions of Vaishnavas found in Sind are the Vallabhachári, the Ramanandi and the Swámi Náráyan sects. The first comprises all Pushkharna and a few Sáraswat Brahmans, all Bhátias, some Khitris and a few Lohánas. They are followers of Vallabhaswámi, who preached (*circa* 1320 A. D.) a somewhat erotic form of Vishnu-worship divorced from the idea of mortification of the flesh, and their worship is addressed to Krishna (one of the incarnations of Vishnu), whose image (*thákur*) is bathed, clothed and presented with flowers, fruit and cooked food. The followers of Ramanand, a reformer who appeared in the 14th century and addressed himself chiefly to the lower castes, consist of the Bairagis. The deity reverenced by this sect is Ráma (a more heroic incarnation), whose temple is called a *thákurdwaro* and whose image is worshipped in similar fashion to that of Krishna. The Swámi Náráyan sect, composed chiefly of Kachhi artisans, addresses its homage to Krishna, his consort Rádhá and the founder Sahajanand, who is regarded as an incarnation of the deity. Their worship resembles in all essentials that of the Vallabhacháris and the temples of both sects are called *mandirs*. The exclusive worship of Shiva is confined to Brahmans other than those already mentioned, Jogis, Saniásis and Gosains, though Rajputs, Ods and Kaláls occasionally pay reverence to him along with his consort Devi, whom they chiefly adore. The usual form under which Shiva is worshipped is the *linga*, upon which his votaries pour

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water and before which they lay their offerings of flowers, fruit and uncooked grain. The temple dedicated to the god is known as a *marhi* or *shivālo.* Shāktas, or the worshippers of the consort, or female energy (*Shakti*), of Shiva, comprise Rajputs, Mális, Bhats, Sonárs, Sochis and some Khatis. The various forms in which the goddess has appeared at different times and places are known by as many different names, which represent totally distinct personalities to the ordinary worshipper ignorant of Brahmanical theology. Thus Káli, Máta, Sitala Máta, Bhawáni, Amba, Chandica Devi and Hingláj Devi are some of the common forms under which the Devi is invoked in Sind. The ritual consists in presenting oil and money to the priest, in burning an incense which fills the temple with a thick smoke and on particular occasions in sacrificing goats, cocks and other animals. Buffaloes used to be commonly sacrificed and the correct manner of killing them was to beat them to death with clubs. There is an esoteric worship of Shakti, accompanied sometimes by much drinking and obscene rites, to which the term *Shákta* is more properly restricted. It is difficult to say to what extent this prevails in Sind, but it is certainly practised. If any place in Hinduism is to be found for the aboriginal tribes, the Bhils, Kolis, Dheds and Shikáris, who have found their way into the Province from Márwár, Gujerat or Cutch, they must be classified amongst the Sháktas, for all of them on occasion pay homage to some form or other of the malignant goddess, though the worship of those who have come from Marwar is more particularly addressed to the Rajput hero Rámdev.* The Bhils also revere another Rajput hero Pábu.†

But there is after all very little religion in Sind that would be recognised as Hinduism in the rest of India. The mass of the Hindu population is composed of Lohánas, of whom a few are Vaishnavas of the Vallabhachári sect, and a larger number Daryapanthis, but the bulk call themselves Nánakshá his. The religion of Guru Nának Shah, who was born in 1469 A. D., was a

* Ramdev lived about 1450 near Pokarn in Jodhpur. He is supposed to have had a miraculous birth and to have performed many prodigies in encounters with Musalmans. He is regarded as an incarnation of Krishna, and in the temples dedicated to his worship the images of a riderless horse and a pair of sandals are preserved.

† Pábu, who also lived near Pokarn, is similarly revered for his prowess against the Musalmans. His image consists of the figure of a man on a horse with a shield, sword and lance.

revolt against Hinduism, with which it is wholly incompatible. He preached the unity of the Godhead and denounced idolatry and caste distinctions. Yet the prevailing religion of the Lohánas in Sind is a blend of the two faiths in varying proportions. Many perform no daily worship whatever, but the more religious repair in the morning to the *tikáno,* where they read a verse or two from the Adi Granth, the sacred book of the Sikhs, of which they repeat at home the portions known as the Japji and Sukhmani: in the evening they attend once more at the *tikáno* and listen to a reading and exposition by the *báwa,* or priest, of the Bhágwat, Rámáyana or other Hindu *shástra.* They venerate Ráma and Krishna and other deities of the Hindu pantheon, but cannot be classed with the Vaishnavas or any other of the ancient sects of Hinduism. On the other hand, though followers of the first Sikh Guru, they have not been baptized into the Sikh communion, nor are they strict observers of the ordinances of that faith. Whilst ordinarily dispensing with the worship of the Hindu gods, they wear the sacred thread and observe all the Hindu rites and a Brahman officiates at the ceremonies connected with their births, marriages and deaths. But they wear their beards in defiance of the law of all Hindu castes. There are, however, stricter followers of the Sikh religion, who have separate places of worship, known as Akál Bhungo, where no Hindu *shástra* is read. There are such in Hyderábád and Karachi. They add *singh* to their names, let their hair grow and wear the iron bracelet. In their temples especially the sacred cake called *Kanáh-Saheb* is made, on which, after blessing, Guru Nának used, in more faithful times, to leave his *panja, i. e.,* the impress of his five fingers. The *Kanah-Saheb* is much revered by Nának-sháhis, who will pay to have it made for them in times of trouble, or difficulty. It is pressed to the eyes and reverently eaten.

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DARYA-PANTHIS.

It would be interesting, if it were possible, to trace the origin of this strange cult, which is found all through the Punjab and north India, but has its sacred place at Uderolal in Sind. There is the tomb of the miraculous infant of that name, who, transforming himself into an armed horseman, emerged from the Indus to rebuke a persecuting Musalman Governor of Tatta and teach him to treat all worshippers of God alike, whatever their

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CASTE MARKS. The outward distinctive signs of Vaishnavism and Shaivism in the *tilak*, or sectarian mark on the forehead, are for Vishnu two upright lines and for Shiva three horizontal lines. The Vallabh-achári mark consists of two red upright lines with a dot in the centre; the sign employed by the Bairágis is two white or yellow upright lines enclosing a red streak; the Swámi Náráyan symbol resembles that of the Vallabhacháris. The three horizontal lines employed by Shaivas are generally yellow, though the more religious make the mark with ashes. But the application of the *tilak* is far from universal: Brahmans and the religious orders are careful in the performance of this duty, but amongst the rest of the population the sectarian marks may be sought for long in vain. A further distinction between Vaishnavas and Shaivas may be noticed in the rosaries worn or carried by the devout: a Vaishnava's rosary contains 108 artificial beads of the *tulsi* or sweet basil plant (*Ocimum basilicum*), whilst the beads of a Shaiva's rosary, though numbering 108, are invariably the rough seeds of the *rudráksha* (*Elæocarpus ganitrus*).

JAINS. The census of 1901 shows 921 Jains resident in Sind, of whom 657 were in the Thar and Párkar and 126 in the Karáchi District. They were probably natives of Cutch, or Marwar.

ZOROASTRIANS There were 2,000 Zoroastrians, of whom 1,841 were in Karáchi, the only place in Sind where Parsis have made themselves at home. They have a fire temple in Frere Street and a tower of silence on a hill about 2 miles east of the Cantonment.

JEWS. Only 428 Jews were enumerated in 1901 and these were nearly all in Karáchi. Many of them belong to the Bene-Israel community, who are believed to have settled in India shortly after the destruction of Jerusalem by Titus.

RECENT SECTS. Most of the religious movements in the Hindu world to which recent years have given birth have found adherents in Karáchi

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and Hyderábád. A Sikh Sabha, established in 1868 in the latter town, was afterwards incorporated in the Bráhmo Samáj, through the influence mainly of a prominent citizen, Navalrái Shaukirám, who, after personal contact with Babu Keshub Chunder Sen, had formally joined the Church of Universal Theism. A *Mandir* was opened in September 1875 and the little congregation set itself actively to the work of social improvement. A Poor Relief Fund, Band of Hope and Social League (Reform Association) are among the institutions established in Hyderábád under the auspices of this body, to the influence of which also the two principal private High Schools, the Nalvarái Hiránand Academy and the Nava Vidalaya, owe their origin. In Karáchi also there is a *Mandir*, but the adherents number only 40. The Arya Samáj, a reactionary movement from the Bráhmo Samáj, based on the authority of the Veda, shows more adherents but less practical results. It has branches in Karáchi, Hyderábád, Tatta, Lárkána, Sukkur and Shikárpur. Theosophy is represented in Karáchi by 46 members, mostly Parsis, who maintain a Reading Room and Library, and in Hyderábád by a smaller number. Other sects of recent origin, which attract less notice among the educated, but have a much larger following, are the Rádha Swámi and Gulábdási, the tenets of which have more in common with the popular ways of thinking.

CHRISTIANITY.

The census of 1901 shows 7,817 Christians in Sind, of whom 5,376 were males and 2,441 females. The British troops stationed at Karáchi and Hyderábád constituted a large proportion of the Christian population, hence the disparity in the sexes. The population was divided by race thus, Europeans 4,221, Eurasians 611, Natives 2,988. Of the Native Christians 2,794 were Roman Catholics and of these 2,546 were found in the Karáchi District. Practically all of them are in Karáchi town, where Goanese must have been in great demand immediately after the conquest. They are clerks, shopkeepers and domestic servants and a large number of them have risen to good positions. Most of the few Protestant Native Christians are adherents of the Church Missionary Society, which has branches at Karáchi, Hyderábád and Sukkur. Some account of its work, which is principally educational, will be found in the chapter on Education, as also of the girls' schools maintained by the Church of England Zenana Missionary Society. There are Roman Catholic Churches at Karáchi, Hyderábád and Sukkur, and at the first-named place flourishing schools, with respect to which the same chapter may be consulted in the A. and B. Volumes.

Musalman Tribes and Castes.

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NAMES.

The tribe or race to which a Musalman belongs is often indicated, though very uncertainly, by his name, or rather his title. The proper names in general use are common to all and are very limited in number. Many of them are those of Old Testament saints, as Ibrahim, Isak, Yakub, Yusaf, Musa (Moses), Daud and Suliman; while others have come down from members of Muhammad's family, like Ali and Husain. But the name of the Prophet himself predominates over all others. There are many compound names ending in Baksh (granted, or gift) Dín (religion) Dád (asked) &c.; for example Khudadád, Asked-of-God (=Samuel) and Illáhi-baksh, Granted-by-God. Muhammad, or Umar, and by Shias Ali, is often added by a man to his proper name. Khojas and Borahs use the Hindu suffix *bhái*, A man is known by his own name and that of his father, connected perhaps by *walad*, which means "son of" and corresponds to Fitz. But a Musalman must be base-born indeed who has not an honorific title and this should indicate his origin. It does not always, because men assume what is not theirs by right, and also because some titles, being official, were borne in the past by men of rank who belonged to various races. Generally speaking Beg indicates Mughal descent, Sháh Persian, Khán Afghan; but the last, which is a Persian title meaning prince, was assumed by the Tálpurs and is so still by men of various descent. Sayad implies a claim to be a direct descendant of the Prophet and Shekh is the proper title of a convert from Hinduism. Mirza, meaning prince, was prefixed to their names by Mughal rulers, as Mirza Gházi Beg, and is also claimed by the descendants of immigrants from Persia who claim princely descent.

Among Baluchis and others to a less extent the name of the Tribe, or Clan, becomes the surname of its members, like McPherson, McTavish, &c. The name of the common Sindhi is used without a title and often indicates his Hindu origin, being derived from the day of the week on which he was born, or from common objects in nature.

AFGHANS OR PATHANS.

Of the 23,061 Afgháns enumerated at the census of 1901, 14,229 belonged to the Kákar and 6,209 to the Gilzai clan. More than one-third of them were found in the District at that time named Shikárpur, which was ruled directly from Kábul from about 1747 to 1824. It is probable, however, that many were traders

and in Sind for the season only. Others were in the Army or Police.

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ALVI.

Alwís are those who claim to be descendants of Ali by wives other than the Prophet's daughter. 1,068 persons described themselves as Alwís at the census of 1901.

BALUCHI.

A tradition prevails among the Baluch (or Baloch) tribes that they came from Aleppo through Baghdád along the border of the Persian Gulf to Makrán, whence they spread into the Indus valley. They say that they were expelled by Yazíd the second Umayid calíph (680-684) and that they settled for a time in Kirman before proceeding to Makran. The tradition is supported to some extent by the similarity between the names of Baluch tribes settled in Sind and those borne by certain tribes in Syria at the present day. But it is futile to attempt to trace the Baluch to any single stock. The tribes and sub-tribes are of various and mixed origins. "The criterion of unity," as Mr. Hughes-Buller says, "is not common descent, but common good or ill." The name of a tribe appears to be referable in many cases to some place from which its nucleus probably came, as Dombki from the river Dom and Bugti from Bug, both on the Persian side of Baluchistan.

The numerous Baluch tribes, with their divisions and legendary origins, are described in Mr. Shekh Sadik Ali's "Short Sketch of the Musalman Races in Sind, Baluchistan and Afghanistan." The following are the most prominent tribes settled in Sind :—

Bugti. This is a transfrontier hill tribe which, having eluded Sir Charles Napier's punitive expedition in 1845, resumed its daring raids on Kachhi and Sind, carrying off on one occasion 15,000 head of cattle from the country round Shikárpur. In 1847 a raiding party containing half the fighting men of the tribe was intercepted and almost annihilated by Lieutenant Merewether, after which their chiefs surrendered and, with about 2,000 of their followers, were settled on lands near Lárkána. Many of these, however, returned to their hills and in 1901 there were only 9,285 Bugtís in the Province. Their chief, Nawáb Sir Shahbáz Khán, K. C. I. E., resides usually at Dero Bibrak in his native hills, but is a great man in Sind, holding large lands in the Upper Sind Frontier and Thar and Párkar Districts.

Burdi or *Buledi*, numbering 65,216, of whom more than 21,000 are settled in the Upper Sind Frontier, at Dari in the Kandhkot

Taluka of which District the present head of the tribe, Khán Bahadur Mír Ali Murád Khán Sundráni, has his seat. There are two other chiefs of sections of the tribe, Ghulám Ali Khán son of Jáfar Khán in the Jacobabad Taluka, and Karam Khán son of Sher Muhammad in the Kandhkot Taluka of the Upper Sind Frontier District. The Burdis formerly infested the jungles of Burdika, subsisting mainly by plunder, and gave much trouble for some years after the British conquest, but under General Jacob's management soon became orderly and peaceable.

Chándia, numbering 72,120, mostly in the Sukkur, Lárkána and Hyderábád Collectorates. This tribe was for many generations so influential in the country about Shikárpur that the whole parganah was known as Chandukah. After the conquest the chief, Wali Muhammad, was allowed to retain his jagirs of Ghaibi Dero, Mirzapur and Khari Ustilla, measuring 1½ lakhs of acres, which were afterwards secured to his son Ghaibi Khán and his heirs by a *sanad* subject, should the British Government see fit, to the payment of a *Nazárána* not exceeding Rs. 2,000 on each succession. The present chief is Ali Nawáz (now called Wadero Ghaibi Khan after his great grandfather).

Dombki, numbering 41,241. This was one of the most warlike of the transfrontier tribes, occupying lands in eastern Kachhi, where their titular chief still resides; but after Sir Charles Napier's compaign against them and the *Jakhránis* in 1845 a portion of the tribe was settled by him on lands given to them at Jánidero in the Jacobabad Taluka. Most of them are now to be found in the Lárkána, Sukkur and Hyderábád Districts. Their chief is Míro Khan *wd.* Baluch Khán Dombki who holds a jagir in the Upper Sind Frontier District.

Jakhráni. This is numerically a small tribe, but was intimately associated with the last and was also settled at Jánidero, where their chief Wadero Baháwal Khán *wd.* Ghulám Ali Khán still resides. His grandfather was the famous robber chief Darya Khán, who gave Sir Charles Napier so much trouble, was forgiven and granted a jagir, intrigued during the mutiny, was deported to Aden and died there.

Jamáli, numbering 26,314. }
Jatoi, numbering 50,793. } These are two peaceful tribes

which have long been settled in Sind. The Jamális, who consider themselves a branch of the great Rind tribe, have three divisions under the following chiefs:—Wadero Lashkar Khan, living at Bakhiro, a Kalát village near the border of Jacobabad Taluka; Sobdár Khán *wd.* Sháhu Khán in Shahdádpur Taluka in the Upper Sind Frontier District; Wadero Hayat Khán *wd.* Bakhsho Khán, who lives at Phulji in the Lárkána District.

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Karmati. This is a small tribe, classed as Baluch and tracing their name to Karmat in Makran, but evidence is not wanting of Súmra or Sama origin and Sir C. Elliot thinks the name points to the adoption by their progenitors of the Karmatian heresy (See Súmra below). They were settled for centuries in Sákro, where their chiefs held jagirs, in which they were confirmed after the conquest. The present chief is Malk Ghulam Sháh *wd.* Daulat Khán.

Khosa, 45,516, said to be a branch of the Rinds. General Jacob says they are "plunderers, cultivators, soldiers, or shepherds, according to circumstances." They supported the Kalhorás, so were out of favour in the time of the Talpurs, when many of them, roaming over Thar and Párkar, were foremost among the raiders who harassed Cutch in the thirties. Their present chief is Hazár Khán son of the late Rahim Khan, Zamindar in Jacobabad.

Laghári, 44,916, a branch of the Rinds, settled chiefly in the Hyderábád District. To this tribe belonged Wali Muhammad Laghári, the ablest and most enlightened minister that the Mirs ever had, whose four sons were confirmed after the conquest in their jagirs in the Hyderábád and Lárkána Districts. The chief of the tribe lives in the Punjab.

Lashári, 29,145. This tribe has no living chief.

Mari. This is a powerful predatory tribe which has its home in the Mari hills, where its chief resides. The tribe appears to have grown out of very mixed elements. The Talpur Mírs came of it. A large number of Maris settled in central Sind long ago, but they retain little connection with the original stock.

Rind, 88,642. This tribe is considered the *elite* of the Baluchi race, the national hero, Mir Chákar Khan, having been a lineal descendant of Rind the son of Jalál Khan. But the tribe has not kept itself pure and its present head in Baluchistan is not even a

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Baluch, but an Afghán, while among men of other tribes there has always been a scramble for the name; so the use of it has become somewhat promiscuous. Wadero Yár Muhammad Khan, resident in Sehwán Taluka, is regarded as the chieftain of the Sind Rinds, the majority of whom are settled in the Lárkána-Shikárpur country.

The *Korái, Magsi* and *Umráni* are small tribes, treated in the census returns as non-Baluchi and written Karai, Mazaj and Murani. Their numbers have been added to the Baluchi total in Table VI.

Of the Baluchi (sometimes called in ballads the *Mirmichi*), Sir R. Burton says that he is a far superior being to the Sindhi, "fairer in complexion, more powerfully formed, of more hardy constitution, and, when intoxicated, sufficiently brave in battle. He has his own ideas of honour, despises cowardice and has no small share of national pride. At the same time he is addicted to intoxication, debauched in his manners, slow in everything except the cunning of a savage, violent and revengeful; his manners are rough in the extreme; his amusements are chiefly field sports and drinking, and his food is coarse and distasteful. As a people the Beloochees are unusually illiterate. There is not, I believe, in all Sind a single learned Beloochee." But Sir R. Burton was an uncharitable witness. He ignores the great Baluchi virtue of hospitality and does less than justice to their courtesy. Mr. A. Hughes-Buller asserts that the Baluch considers cleanliness and bravery to be incompatible.

BANI ABAS.

Bani Abás, or Abásis, are descendants of Abás, the uncle of the Prophet, but it is open to question whether many of the 7,392 persons who described themselves as such at the census of 1901 have Arab blood in their veins. They are completely fused with the indigenous races.

BORAH.

Boráhs first migrated to Sind shortly after the British conquest; and are contractors and traders, or keep shops and deal in iron and tin ware. All Sind Boráhs are Dáudis of the Ismaili sect. They are strict observers of the *ashúra*, or anniversary of the massacre of Karbala, and of the fast of Ramzán, and look upon the pilgrimage to Mecca as compulsory for all who can afford it: the pilgrimage to Karbala is also performed, but it is not

considered obligatory. They repeat their prayers, like ordinary Shias, thrice daily and they follow the law of *zakát*. They meet in mosques and their priests are called *mullas*: they have no special service on Friday. They are zealous in religion and good men of business. They marry in their own community, generally at the age of 15. Circumcision is performed before 7. The moustache must be worn but may be trimmed: the beard must be neither cut nor trimmed.

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BRAHUI.

Brahuis are the most numerous race in Baluchistan and the one to which the reigning family belongs. They distinguish between themselves and Baluchis, calling the letter *Nhárui, i. e.*, lowlander, and Masson thinks *Brahui* may be a corruption of *Ba-rohi*, meaning literally, "of the waste," so that the two names may contrast like highlander and lowlander. Others consider Brahui to be an eponym from Braho, which is a common contraction for Ibráhím. There has been much speculation as to the origin of this strange tribe, whose language, *Brahuiki*, has no affinity with *Baluchki*, being considered by the best authorities to belong to the Dravidian stock. On the other hand there is much evidence among them of a Scythian origin. The three largest Brahui tribes are by themselves classed as *Jadgal*, which means *Jat*, while in Makran Brahuis are commonly called *Kurds* and their language *Kurdi*. There is a curious tradition also that they are Beni-Israel, descendants of Jews exiled in the time of Nebuchadnezzar. They are *Sunis*, but it is stated that they have no *sayads*, *pírs*, nor *mullas*, among them and are much less bigoted than Baluchis. They do not differ from the latter noticeably in dress or customs, except that their women are particularly fond of indigo, a colour that Baluchis will not wear; but the Baluchis look down upon them. "No self-respecting Baloch will give his daughter in marriage to a Brahui" (R. Hughes-Buller, in Report of Baluchistan Census—1901). There are 47,345 Brahuis in Sind, of whom 17,854 are within the limits of the former Shikárpur District and 12,055 in the Karáchi District. They are divided into many sub-tribes.

CHACHAR.

Cháchars (16,760) are a tribe of Hindu origin like the Sama tribe, of which they may be a branch. They live on the right bank of the Indus in the Upper Sind Frontier, Sukkur and Lárkána Districts and are cultivators or cattle breeders.

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DAHAR.

Dáhars (4,730) are of Hindu origin, like the Samá tribe, of which they may be a branch. Unlike the Samás, they refer their origin to a Hindu king Dáhar, who was killed by the Arab conqueror Muhammad Kásim. In the times immediately preceding the rise of the Kalhorás they gave much trouble to the governors of Bukkur. They were ruled by a Jám, who retained his authority under the Kalhorás, but was dispossessed by the Tálpurs. They allowed him, however, one-eighth of the revenue and certain zamindari rights, which were confirmed by the British Government and are enjoyed by his successors to the present day. The Dáhars are settled mostly in Ubáuro Taluka and are chiefly cultivators.

DHAREJA.

A tribe of comparatively recent immigrants from Rájputana who have become Musalmans. They are settled about Ghotki as farmers.

INDHAR.

Hindus recently converted to Islám and settled as farmers and cattle keepers in the Ghotki, Sukkur and Shikárpur Talukas. It is said that the sacred threads which they renounced on their conversion are preserved at the shrine of Pír Músa Nawáb in Bahawalpur territory.

JAT.

The Jats are a Sindhi tribe apparently of Scythic extraction, which was settled in the earliest times of which a record exists in Nudha, the modern Kachhi, whence they appear to have wandered to the south of Sind, where they are now most numerous. There the geographer Ibn Haukal found and described them in the 10th century (see page 88, note). They were breeders of camels, for which their country was famous. They have retained the same occupation to this day and given their name to it, so that the term is colloquially equivalent to camel-man. In Baluchistan the word means strictly a camel-man, the tribe being distinguished as Jat (with a hard t), which again in Sind is a common term for a boor or blockhead. The whole subject requires investigation. There were 77,920 Jats in Sind in 1901, and those in the south of the Province have a chief, who is Malk Ghulam Husein *wd.* Malk Jahán Khan, of Játi, a First Class Jágirdar.

JOKHIA.

This tribe, like the Númria (q. v.), to which it is related, was included in the Samás in the Census of 1901, so its strength is

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not known. It also appears to be of Rájput origin, but came into Sind from Makran. Jokhias infested the Delta and plundered traders at least two centuries ago, but the tribe was obscure until the time of Ghulam Sháh Kalhora, who rewarded one Bijar Jokhia with the title of Jám for assassinating the Rája of Dhareja (see History). Under their new chief the tribe rose to power and occupied all the country between the Habb River and Ghára Creek, south of the Malír. The Jám was granted a right to levy customs duties on all merchandise passing from Karáchi to Tatta and various other privileges which yielded him an income of Rs. 6,500 a year. He also shared with the Númrias the privilege of protecting caravans from Karáchi to Sehwán. After the British conquest the ruling Jám, Mihr Ali, was confirmed in his rank and granted a jagir. The present Jám, Murád Ali of Malír, is his son. The *Panwhars* of Sehwán appear to be a branch of the Jokhias and the *Burfats*, or *Bulfats*, of Las Bela are allied to them.

KALHORA.

Kalhorás claim descent from Abás the uncle of the Prophet, and probably belong to the same stock as the Daúdpotras (see page 108). The Kalhora rulers were Shias and many of the tribe, especially those who dwell in towns, are of the same persuasion, but rustics are mostly Sunis. At the last census 21,441 persons were returned as Kalhorás. The Kalhora chiefs were called *Mian* and considered to be persons of great sanctity: their followers are still known as Miánwáls.

KHADRAS.

Khadrás (*i. e.* Eunuchs). These form a distinct religious, or mendicant, order in Sind, though no account of them was taken at the Census. The community originated with the numerous zenána eunuchs who were liberated, *i. e.*, thrown on the world helpless and friendless, after the British conquest and naturally banded together. How it has been recruited since is not known even to the Police. Khadrás, whether originally Hindu or Musalman, dress like women, call themselves Fakírs, acknowledge a headman, have a creed of their own, worship Bakrásar Devi, or Deval Devi, offering her, instead of flesh, a paste (*Síro*) of flour, sugar and *ghi*, and set up her image in a *Marhi*. They are distributed all through the Province and have a pathetic custom of presenting themselves at any house in which a male child has

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KHOJA.

been born and asking for alms, which on such an occasion are probably never refused to them.

The Khojás, or Khwájás, are descended from Lohánas who embraced the Ismailian form of Shiaism in the 15th century, with an admixture probably of refugees from Persia. They comprise two sects, the *Piráis* and the *Panjbháis*, of which an account has already been given under Religion. The *Pirá́is*, though they still retain Hindu customs connected with birth, marriage and death, profess a creed which approximates to Shia orthodoxy. They have no mosque, but they meet for prayers in a building called a *mumbar*. They offer prayers thrice daily, but have no special service on Friday. They do not bestow their alms upon the Aga Khan, having abjured their allegiance to him, or been excommunicated. The *Panjbháis* are followers of the Aga Khan, as the vicegerent of the "unrevealed Imam," to whom they pay their *zakát*. They pray thrice in the day, but the same formula is repeated on each occasion: the prayer contains a mixture of Hindu and Islamic terms. Their head-man is called *mukhi* and persons well versed in their creed are known as *bhagats*, both words being of purely Hindu origin. They have no mosque, but meet for prayer in a *jamáit khánah*, or lodge.

Outside Karáchi the *Pirá́is* and *Panjbháis* live generally in the same community and sometimes intermarry. Khojas wear or shave the beard as they choose, and the *Pirá́is* generally prefer to retain it: the moustache is not shaved. Early marriages are not regarded with approval: circumcision is generally performed at the age of 2 or 3.

KURESHI.

Kureshís are Arabs of the tribe to which the Prophet belonged. The census of 1901 shows 24,266 persons of this tribe, but it is practically certain that a great number of these people are not Kureshís and have adopted the name only to raise themselves in the social scale. Kureshís are all Sunis. Among them are some of the most venerated *Pírs* in the country.

LAKHAN.

A small tribe, which seems to be of obscure Hindu origin, settled near the river in the Rohri Division, farming and breeding cattle.

MAHAR.

Mahars (31,429) are a tribe of Hindu origin found chiefly in the Shikárpur (Sukkur and Lárkána) District, where they were

associated with the Dáhars in turbulence before the rise of the Kalhorás, and also in the Hyderábád District. The name is probably identical with Mer (or Mihira) and the race with the *Mers* of Ajmir and Kathiawar, who are by some considered to be descendants of the Scythian Meds. At some time before the middle of the 17th century the Mahars, or a section of them, effected a settlement on the west of the river, near where Shikárpur was afterwards built. Here they came into conflict with the Daúdpotras, by whom they were subjugated, or expelled. They are now farmers and cattle breeders. Their chief is Muhammad Baksh Khan *wd.* Haji Khan, a zamindar of Khánpur in Mirpur Taluka of the Sukkur District.

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MEMAN.

Memans (= *Muamins,* or Believers) are said to be the descendants of Lohánás converted to Mahomedanism at Nangar Thatta (Tatta) in the middle of the 15th century by a saint from Baghdád named Sayad Yusif-ud-din Kadiri. They afterwards migrated to Bhuj and spread to Bombay, but many remained in Sind and are a prosperous and much respected community. Though most successful in trade they also follow agriculture. They are Sunis of the Hanifi School, religious and fond of learning. The Sindhi differ from the Kachi Memans in that they follow the law of inheritance laid down in the *koran* and do not dispose of their property by will, as the latter have taken to doing. Hence their wives and daughters always receive the provision which the Prophet ordained.

MUGHAL.

The term Mughal, which is the same as Mongol and its derivative Mongolia, is loosely applied in India to all foreign Musalmans from the north-west, except Patháns. Two Mughal dynasties, the Arghun and Tarkhán, held power in Sind for a short period and from them and their followers are descended most of the 10,293 Mughals found in the country at the present day. Mughals are Musalmans of the Shia sect.

MUHANA.

Muhána (107,383). The derivation of this name is uncertain, but it denotes the Musalman fishing caste in Sind, with all its numerous divisions, on the sea-coast and inland. The Muhánas of Makrán are called *Meds* and that name is not unknown in Sind; but it seems impossible now to trace the continuity of these with the Scythian Meds who lived on the banks of the Indus a

Musalman Tribes and Castes.

thousand years ago. The Muhánas are not only fishermen, but sailors and boatmen. Inland they are commonly called *Mírbahar*, which is an honorific title meaning "Lords of the Sea." Many of their divisions are merely local, as *Karáchia* and *Lária;* and the relations of these to each other with respect to intermarriage, &c. are various.

NUMRIA.

In No. XIII of the Imperial Tables of the Census of 1901, the Númrias, Lúmrias, or Nau-mardis, appear to be included in the Samás on the assumption that they are a branch of that tribe. This is unfortunate, for they have occupied quite a distinct place in the history of Sind. That they are of Rájput origin need not be disputed, but, having early settled in Baluchistan, their affinities have always been with the people of that country. Abul Fazl in the Ain-i-Akbari describes the Khírthar hills as the dwelling place of the tribe of Nuhmardi Baluchis. Just before the British conquest they held all the hill country between the Habb and the Indus and between the Bárán and Malír rivers and levied black mail (*nath*) on all merchandise passing between Karáchi and Sehwán and Kotri, in return for which they were responsible for its safety. Their chiefs (*malks*) were allied by marriage with the Khán of Kalat, the Jám of Las Bela and the Tálpur Mírs. Sir Bartle Frere described them as probably the largest tribe in lower Sind. Besides their lands these *malks* enjoyed many miscellaneous rights, such as the fish, opium and liquor contracts at Kotri. The following first class Jagirdars are their descendants.

Malk Sobdár Khán *wd.* Malk Sardár Khan, the Chief of the Númrias, and Malk Dodo Khan *wd.* Malk Salar Khan, residents of Kotri Taluka.

SAMA.

The Samás are a branch of the great stock of Yádav Rájputs and have been settled in Sind from time immemorial. Samanagar on the Indus was their ancient capital and is probably represented by the modern Sehwán. When they seized the supreme authority, in the fourteenth century, their first capital was Samui a few miles north of Tatta. The Lákhas and Sahtás mentioned in the Chachnámah are Samá tribes. With the exception of a few Sahtás the Samás are now all Musalmans. There are 732,897 Samás in the Province.

Musalman Tribes and Castes.

SAYAD.

The term Sayad means Chief and is applied exclusively to the descendants of the Prophet's grandsons Hasan and Husain. Sayads are therefore either Hasani or Husaini. The census of 1901 records 10,607 Hasani and 25,613 Husaini Sayads in Sind, but the hallowed name is easily assumed and not willingly disputed, and we may very well be sceptical whether more than a very small percentage of this great host has any of the blood of the Prophet in its veins. When the heathen Mughals were devastating the Musalman kingdoms in Central Asia many pious and learned Sayads found refuge in Sind and others followed later and settled in Sehwán, Bukkur or Tatta, whence their descendants spread, being greatly favoured by most of the rulers, especially the Tálpurs. The men of note among them in each district are mentioned in the B. Volume concerned.

SHEKH.

Though they have been tabulated in the census returns as Arabs, the Shekhs of the Province, like those of other parts of India, are probably without exception recent converts from indigenous races. The number recorded at the census of 1901 was 31,653. They are all Sunis.

SINDHI.

In the census of 1901 no less than 6,11,158 persons were registered as Sindhis, but there is no such caste. The term covers any native of Sind, though in common use it would exclude those, like Baluchís, Brahuis, or comparatively recent settlers from Cutch, who are still regarded as foreigners. We must conclude therefore that the Sindhis of the Census were Jats and Samás and Súmras and members of minor tribes who, failing to make their exact position clear to the enumerators, were lumped together under the general head. Of course this vitiates to a great extent all the figures given under those castes to which this large number belonged.

SIRAI.

This name is applied to settlers from the Punjáb, who are numerous in the Lárkána District and speak the *Siráiki* (= north-country) language; but it does not indicate a tribe. It was a common appellation of the Kalhorás when they were rising into power.

SUMRA.

The Súmras are a branch of the Pramara Rájputs, who appear to have enjoyed more or less power in Sind from the 8th to the middle of the 14th century and towards the end of that period

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were independent rulers. From the contents of a letter addressed by a Druse apostle to Shekh Ibn Sumar Raja Bal of Multán in 1032 A. D.,* it is conjectured by Elliot that, before they apostatized from their ancestral faith to Islám, the Súmras had intermediately adopted the tenets of the Karmatian heresy. They are now Sunis, but the date of the conversion is not known. The number of Súmras in the Province is 102,753. The majority of washermen and dyers are Súmras.

UNSPECIFIED.

Besides these there are innumerable names which may be given in answer to the question, What is your caste? Some indicate the speaker's trade, or that of his father or grand-father, some the Hindu caste to which his people belonged before they became Musalmans, some the nationality of a fore-father. Examples are:—*Akhúnd* (a teacher), *Kásid* (a courier), *Mírási* (a musician), *Gola* (a slave), *Kháskheli* (an attendant slave), *Shídi* (a Negro), *Habshi* (an Abyssinian), *Gada* (a half-cast Negro or Abyssinian). In the census of 1901 no less than 611,158 persons were registered as Sindhi Unspecified.

HINDU TRIBES AND CASTES.

Hindu Tribes and Castes.

NAMES.

The name of a Hindu is often an index to his caste. The name itself is sometimes one common to all Hinduism, being that of one of the deities in the pantheon, as Naráin and Rám; and sometimes one peculiar to Sind and the Punjáb. To this the upper castes always add a suffix, except in their families and among intimates. Among the Lohánas the common suffixes are Rái (= Ráo, a king), Dás (a slave) Rám, Mal, Chand, Lál and Nand. Thus the child Híra, an emerald, or Moti, a pearl, becomes the gentleman Hiránand, or Motirám. Of these suffixes Mal, one of the commonest among Banias, is eschewed by Amils, especially after certain names. Thus a man named Shewakmal may confidently be put down as a Bania: if he were an Amil he would call himself Shewakrám. Brahmans use generally the same suffixes as Lohánas, but the term *ji*, expressive of respect and equivalent to Sir, which is so familiar a suffix in Gujerat and the Deccan, appears to be restricted in Sind to Pushkarna Brahmans. Some Hindus have the Musalman suffix Baksh and those who follow the Sikh religion closely indicate it by putting Singh after their names. But the

* Elliot's History of India, Vol. I, p. 491.

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name is permanent and hereditary, while the religion may be volatile.

A Hindu is usually known by his own name and that of his father, but a distinguishing title often comes into use and acquires the force of a surname. This is most frequently derived from the place of birth or long residence, with the Baluchi *áni* added, like Lahoráni, or from an ancestral name, with the same addition. In Sind, as everywhere else, there is a modern tendency to give prominence to these surnames where they exist and perhaps to assume them.

Hindus of the lower castes are distinguished by the absence of suffixes, the place of which is often taken by the name of the man's trade or caste; *e. g.* Pursu Sonáro, which is exactly equivalent to Tom Goldsmith. The names themselves are generally different from those of the upper castes, being sometimes derived from the days of the week, as Sumo, or Sumar, Mangal, etc., and sometimes from animals and common things.

BAIRAGI.

The word Bairágí denotes a person devoid of passion and is applied to a religious order of mendicants who profess to have estranged themselves from the interests and emotions of mankind. Bairágís are therefore not a separate caste. The order admits members of any Hindu caste and falls into two divisions known as *Bindi* and *Nádi*: the latter abjures marriage whilst members of the *Bindi* division are permitted to marry. Bairágís live entirely on charity and abstain from animal food: they are worshippers of Vishnu. In 1901 they numbered 2,187, of whom 922 were females, so Bindiism is evidently the more popular doctrine.

BANIA.

This name, which is merely a vulgar form of *Wánia,* or *Wáni,* or *Váni,* and should indicate a member of some divison of that great caste, has become the common Indian and Anglo-Indian term for a Hindu merchant, shopkeeper, or money-lender. In Sind it most commonly indicates a Lohána who is not an Amil, but in Thar and Párkar a Kirar.

BHAT.

Bhats, numbering 3,546 in 1901, belong to one of those castes for which Hinduism has invented a hybrid origin: they are said to have sprung from a Kshatriya father and Vashya mother. They are hereditary bards whose services consist in attending marriage and other ceremonies, for which they receive customary fees.

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Their diet includes meat and alcohol, but Márwári Bhats are vegetarians. They form an endogamous caste and are worshippers of the goddess.

BHATIA.

Bhátiás, of whom 9,500 were enumerated in 1901, claim to be Bhati Rájputs of the Yádav stock, who are the ruling tribe in Jaisalmer, but this is very doubtful. They are one of the great trading castes, the connections of which form an exceedingly difficult ethnological problem. In the census they were classed as Vánis. In Sind they are enterprising traders and a few are in Government service. They form an endogamous caste with 84 exogamous sub-divisions. They are Vaishnavas of the Vallabhá-chári sect and are mostly vegetarians. They burn their dead.

BHIL.

Bhils, numbering 36,157 in 1901, are immigrants from Márwár and the great majority of them are in the Thar and Párkar District. Their occupations in this Province consist of menial service and labour. They generally marry amongst themselves. They bury their dead, eat the flesh of every domestic or wild animal, except the horse, ass, camel and monkey, and are much addicted to drink. They revere all deities, especially *Devi* and the two tribal heroes Pábu and Rám, but the principal objects of their worship are the spirits of the jungle.

BRAHMAN.

The majority of Brahmans in Sind, of whom 13,376 were returned in 1901, belong to one or other of the three endogamous divisions Sáraswat, Pushkarna and Shrímáli. The first, written Sarsudh in the Census report, is one of the five Gauda families of Brahmans. There were originally three endogamous divisions of Sáraswat Brahmans in Sind, Bárhi with 12 sub-divisions, Báwanjáhi with 52 sub-divisions, and others, but with the exception of a few families the two first divisions have now intermarried. In Upper Sind Sáraswats are now divided into Sáraswats and Kherájani Sáraswats, the latter being considered inferior: in Lower Sind similar divisions are called Setpáls and Sárawats, the former being able to marry with the Sáraswats of Upper Sind and the latter with the Kherájanis. With the exception of a few who have entered Government service, Sáraswats are the spiritual guides of the Lohánás, at whose ceremonies they officiate. Pushkarnás and Shrímálís are both sub-castes of the Gurjar family, one of the five Dravida families of Brahmans. Pushkarnás, or Pokarnás, are chiefly confectioners, or are employed as cooks by well-to-do

Brahmans and other vegetarian Hindus. Bhátias and in rare cases Lohánas employ Pushkarna Brahmans as their priests; a few Pushkarnás are also astrologers and traders. Shrímálís are mendicants and accept as alms things which are considered degrading by Sáraswats and Pushkarnás: they are frequently engaged by Hindus of all classes to repeat verses with a view to the propitiation of unfavourable planets. Sáraswats as a class are mostly Vallabhácháris and worshippers of Krishna, though many worship Shiva and Saraswati. Pushkarnás are all Vallabhâchárís, whose special deity is Krishna. Shrímálís worship Shiva. But Brahmans, though they address their worship more particularly to certain deities, revere all the gods of the Hindu pantheon. Sáraswats in the villages partake of meat and alcohol, but in towns they observe a stricter diet, or profess to do so: Pushkárnás and Shrímálís are vegetarians. A Sáraswat will eat food cooked by a Lohána, which the other two classes will not touch. Sáraswats speak Sindhi, Pushkarnás and Shrímálís Sindhi, Gujaráti and Márwári. In addition to the above there are a few depressed Brahmans known as Chhanchhriás or Sáwnís, who subsist on alms obtained for propitiating Saturn.

CHARAN.

The Chárans, (also called Barats), are a semi-sacred caste, held in honour among Rájputs as bards, of whom 4,415 were enumerated in 1901, mostly of course in Thar and Párkar. They are generally not well off and live partly by begging, but also deal in cattle, cultivate land, or take service. They burn their dead, except infants under a year, eat meat and drink spirits and dress like other Márwáris.

DHED.

Dheds, numbering 70,678 in 1901, are the principal out-caste race of Gujerát and Rájputána, whose presence in Sind was largely due to the famine prevailing in those provinces. But most of those found in Thar and Párkar, who were more than 30,000, were probably permanent. One of their chief occupations is to strip dead animals of their skins. They are worshippers of *Devi* and bury their dead.

GOSAIN.

Gosáins, of whom 1,619 were enumerated in 1901, form a religious order of mendicants and not a caste. Members of any Hindu caste are admitted into the order on performing certain ceremonies and submitting to certain rules of discipline. The chief occupation of the order is mendicancy. Gosáins are

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worshippers of Shiva: they are allowed to marry within the order and to partake of meat and alcohol. They wear ochre-coloured garments and their dead are buried in a sitting position with a quantity of salt under and above the body: some however throw their dead into the Indus.

HAJAM OR NHAVI.

Under this head 1,682 persons were enumerated among Hindus in 1901. The heading is misleading, *Hajám* being the Musalmani and *Nhávi*, or in Sind *Nái*, the Hindu name for a barber. The Hindu barbers in Sind come mostly, it appears, from Márwár, Cutch, or Gujerát. As everywhere else in India, the barber is a most important person, including among his functions those of rural surgeon, matrimonial agent and local news-vendor. His wife is the village midwife and "gossip." It is lucky to meet the *Nái*.

JATIA.

Játias come from Márwár and are tanners of hides and skins. In 1901 they numbered 1,064. They form an endogamous caste with numerous exogamous sub-divisions. They use meat, fish and spirits, but not birds. They are worshippers of Shiva and revere Rámdev as their patron saint. Játias cremate their dead. They have a practical monopoly of the hide tanning trade in Hyderábád and many of them are well-to-do.

JOGI.

Jogís are members of an ascetic order of mendicants which admits recruits from any Hindu caste. It is doubtful whether it should be called an order at all, for the word *Jogi*, or *Yogi*, simply means one who practises *yog*, *i. e.*, an ascetic. Their sole occupation is mendicancy. Some do not marry; those who do so marry within the order. They wear garments dyed with ochre and some, called *Kanphárs*, wear thick earrings of glass, wood or metal. In regard to diet the practice is not uniform: some indulge in meat, whilst others are vegetarians. The worship of the order is addressed to Shiva, whilst Gorakhnáth, who flourished in the beginning of the fifteenth century, is their patron saint. The dead are buried in a sitting position with a quantity of sugar under and above the body. The number enumerated in 1901 was 2,324, of whom 1,250 were in the Hyderábád District.

KHITRI.

At the last census 7,336 persons returned themselves as Khitrís, but there is little doubt that the number is largely composed of Amils who prefer a Kshatriya to a Vaishya lineage. Khitris are a

Punjáb caste, of which members are found in old Hála and a few other places. They are engaged in banking, trade, Government service and agriculture.

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KIRAR.

A large proportion of the Banias in Thar and Párkar belong to this caste, about whom little has been ascertained. In the census of 1901 they were evidently included in Lohánas, with whom they have no connection. Their native place is Márwár, where they are said to live mostly by husbandry, and whence they are said to have immigrated about 250 years ago. They are most abundant in Chháchhro, Mithi and Nangar Párkar, the parts nearest to Márwár. In religion they are Vaishnavas. The name Kirár appears to be sometimes misapplied to Lohána shopkeepers by Musalmans who do not know the difference.

KOLI.

Kolís, of whom 32,126 were enumerated in 1901, almost exclusively in the Hyderábád and Thar and Párkar Districts, are a great and ancient race which is now chiefly settled in Gujerát. According to their own legends they are descended from the Meds of Sind, but clear traces of a Rájpút connection appear to be found among them.* The caste is an endogamous division: widow marriage, except in the case of young girls, is not allowed. In Sind Kolís work generally as day labourers. Their diet consists principally of bajri and rice, though meat and alcohol are freely taken when obtainable. They worship the Hindu gods and goddesses: some belong to the Swámi Náráyan and other sects.

LOHANA.

Lohánas, numbering 413,049 in 1901, form the bulk of the Hindu population of the Province. The derivation of the name and the caste is obscure. The desire to establish a Kshatriya lineage is doubtless responsible for the theory advanced by some Lohánas that their ancestors were warriors. In the Census Report of 1901 they are classed under the great trading caste of *Vánis*, and in Sind those of them who are engaged in trade are called Vánia, but Sir J. Campbell regards them and the Bhátias as distinct stocks from the *Váni*. They are numerous in Cutch and Kathiawar, but a large proportion of those in Sind have come from the Punjáb. Lohánas possess a remarkable aptitude for business and education. Under the Kalhora and Tálpur rulers Lohána officials, who were termed Amils, filled many, including some of the most important, appointments in the civil service. The

* *Vide* Bombay Gazetteer, Vol. IX, Part I, p. 238.

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adoption of this profession, though it exposed them to many insults and humiliations, quickly conferred on the families concerned a superior status, which they signified by differences in dress and which their descendants have never lost. These people now form an hypergamous sub-division of the caste: they will take brides from, but will not give brides to, the other Lohánas. The result is that, while Amil parents are in a position to stipulate for a substantial dowry with the bride selected for their son, they find the bestowal in marriage of their daughters a matter of increasing difficulty and expense. The chief occupations of the Lohánas are trade and money-lending and Government service, with which they now largely combine land holding. *Vánia*, as mentioned above, and *Bháiband* and *Kirár* are names by which they are also known, but see Kirár *supra*. They form an endogamous caste, with a great number of exogamous sub-divisions. In religion they are mostly Nánakshábis, though some are Daryápanthis and a few are goddess worshippers; a smaller number again are Vallabhácháris. Their diet is influenced by their religious profession, but the majority have no objection to meat (except beef) or alcohol. They burn their dead, but children dying under 27 months are buried.

MENGHWAR.

Menghwárs, a low caste like all leather-workers in India, originally came from Rájpútána, but have been settled long in Sind, where they are engaged in making shoes and weaving coarse cloth; they also make girths, stirrup leathers, reins and similar articles. Their number cannot be stated as they were not specified at the last census. They bury their dead.

OD.

Ods, of whom 4,664 were enumerated in 1901, are immigrants from Márwár and still speak among themselves a dialect which is said to be a mixture of Márwári, Gujaráti, Marathi and Sindhi. Their primary occupation is the building of mud walls. They are an unsettled people constantly moving in search of employment. The caste is an endogamous division containing several exogamous sub-divisions named after Rájpút tribes, *e. g.* Ráthor, Chohán, Bhati, Solanki, Tunwar, Parmár. They eat meat, drink alcohol and bury their dead. They worship *Mahádev* and *Devi*; Rámdev is their patron saint.

RAJPUT.

The Hindu Rájpúts in Sind numbered 26,197 in 1901, of whom 16,475 were in Thar and Párkar, where the Sodhás were for some

centuries the dominant race. According to their own tradition they came from Ujjein about A. D. 1226, under the leadership of one Parmár Sodhá, who, after hard fighting, got possession of Umarkot and established himself as a Rána there. Even under the Tálpurs the Sodhá landlords retained important revenues and privileges, such as the right to levy a cess on Hindu marriages and to be fed by Banias free of charge when travelling. They retain the Rájpút custom of giving their daughters in marriage to other castes and, the beauty of Sodhá women being celebrated in song and story, even Baluch Sardárs have not disdained to take Sodhá wives. The men are land-owners and cultivators: they also take private service. In religion they are worshippers of Shiva. Besides the Sodhás there are many Rájpúts in Sind of the Ráthor and Solanki tribes. **Hindu Tribes and Castes.**

SAHTA. This caste is interesting on account of the possibility of its being a remnant of the Sahta sept of the Samá tribe (q. v.) which has resisted conversion to the Musalman faith. The Sahtás themselves, while claiming Rájpút origin, are disposed to derive their name from the village of Sáhiti in the Naushahro Taluka, in which they were settled formerly, but this is not a probable explanation. There were 3410 of the caste enumerated in 1901, almost all in the Karáchi District; but it is probable that many of this caste described themselves and were enumerated as Rájpúts. They are traders, landholders and Government servants, and in religion mostly Vaishnava. They take wives from, but do not give their daughters to, other castes. They do not refuse mutton, fish or spirits, and in their customs resemble the Lohánas.

SANIASI. Saniásis, numbering 3,173 in 1901, are not a caste but an order of religious mendicants. The term properly denotes a Brahman in the fourth stage of his life, when he has set himself free from all earthly possessions and all natural affections; but now any caste Hindu is eligible for admission to the order. They are worshippers of Shiva and wear a yellow shirt. They are not supposed to marry, but 1,233 of the above number were females. Most of them abstain from animal food, but intoxicate themselves with *bhang* more than almost any other class. They live by mendicancy.

SHIKARI. Shikáris, of whom 4,373 were enumerated in 1901, are out-caste immigrants from Rájpútáná. They are found from Bengal to

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the Punjáb and the origin of their honourable appellation is unexplained. It seems likely that, possessing, like the Bhíls and other aboriginal races, a knowledge of wild animals and skill in tracking, they were generally employed by Musalman nobility in quest of sport and so called huntsmen. They eat carrion and, even when professing Mahomedanism, are considered unclean and not allowed to enter a mosque, unless they undergo a ceremony of purification by fire, after which they are classed as *Máchhis.* In Sind they are engaged in making winnowing baskets (*chhaj*) and baskets (*khári*) used for carrying earth and also take employment as sweepers and scavengers. They appear to correspond in most points to the *Bhangís* of Gujerát.

SONAR.

Sonárs are gold and silversmiths : those of Sind belong to one of three geographical, endogamous divisions, Sindhi, Márwári and Kachhi. They are not held in such high estimation in this as in other provinces, where they are reckoned among the highest of Súdrás. In the Deccan they deny their Súdrá origin and dispute the authority of the Brahmans. In Sind they are said to be worshippers of *Devi.* Their diet includes mutton and alcohol. They burn their dead, but children under 3 are buried. At the last census 8,387 Sonars were enumerated, of whom a large proportion were in the Hyderábád District.

It is impossible to note all the Hindu castes found in Sind at the census. Many are foreign and quite insignificant numerically, while others are under names which indicate a trade, such as *Máli, Sutár, Kumbhár* or *Lohár,* and do not show even of what province the bearer is a native.

Language.

The natives of the Province, whether Hindu or Musalman, speak the Sindhi language, which has been thus described by Sir R. Burton, one of the greatest authorities on the subject in his time. "The Sindhi dialect is a language perfectly distinct from any spoken in India. It is spoken, with many varieties, from the northern boundary of Kattywar as far north as Bhawulpoor and extends from the hills to the west to the Desert which separates Sind from the eastern portion of the Indian peninsula. These limits will agree with the Moslem accounts of the extent of empire belonging to the Rae or Hindoo rulers of Sind. Its grammatical structure is heterogenious, the noun and its branches belonging to the Sanskrit, whereas the verb and adverb are

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formed, apparently, upon the Persian model. The dialect abounds in Arabic words, which, contrary to the usual rule in India and Central Asia, constitute the common, not the learned, names of things, as Jabal, a hill; Basar, an onion (in Arabic Basal); Abbo, a father; Thúm, garlic (from the Arabic Fum); Shay, a thing; Kull, all; *etc.* Pure as well as corrupted Sanskrit words, perfectly unintelligible to unlearned natives of the Indian peninsula, are perpetually occurring in Sind, as Sanee, sir; Kukkur, a cock; Jas, victory; Apár, endless; *etc.*" Dr. Ernest Trumpp, a greater authority, describes Sindhi as "a pure Sanskritical language, more free from foreign elements than any other of the North Indian Vernaculars," and "much more closely related to the old Prakrit than the Marathi, Hindi, Panjabi or Bengali of our days." There are of course local dialects and vulgarisms. Hyderábád is the model and the language spoken in the Vicholo, or middle country, of which it is the social centre, is "pure Sindhi." From Tatta southwards the dialect of the Lár, or low country, prevails, of which the most noticeable peculiarity is the dropping of the letter H, even in the aspirated consonants. There are also many peculiar words in use, imported from Cutch and Thar. The three northern Talukas of the Hyderábád District are called *Utar* and their dialect *Utrádi*. It resembles Shikárpuri: *hitre* and *kithre* begin to take the place of *hite* and *kithe*. In Shikárpur, besides such differences in pronunciation, there are a good many words in common use which betray the influence of Hindustani, such as *dhobi* instead of *khati* for a washerman and *bhangi* instead of *shikári* for a sweeper. In this region there is also a distinct dialect in use, known as Jatki, or Siráiki (*i. e.*, the language of the north country), which is common to it and part of the Punjab and is regarded by Sindhis as a dialect of Panjábi. Panjábis, on the other hand, are said to consider it a dialect of Sindhi. It is spoken chiefly by the Jats and some of the Baluch tribes (Rind, Lagbári, etc.) and by the Abbássis. There is another more or less distinct dialect called Thareli, spoken by the nomads and wild people of the Thar desert. It appears to be compounded of Sindhi, Márwári and other ingredients. The tongue of Ubáuro, which has become proverbial for corruptness, is perhaps only an extreme form of this. Many Baluchis use among themselves the Balochki language, which has been described as Persian disguised under a corrupt and unaccountable system of pronunciation, but

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is really a distinct language belonging to the Iranian branch of the Aryan group; while the Brahuis very generally use their own Brahuiki, a tongue apparently of the Dravidian stock which has given rise to much speculation. But all resident Baluchis and Brahuis understand and can speak Sindhi. Afgháns, Marathás and Gujeráthis speak their own languages among themselves and the last are so important in Karáchi that notices and signboards are often written in Gujerati. Hindustani is generally understood in large towns and English is coming into general use among the educated even for their private correspondence. The Arabic-Sindhi alphabet is universally employed now in writing and printing Sindhi, except by Banias, who still cling to the Nágri stenography known as Bania, or Hindu-Sindhi, for all purposes of business. A few old-fashioned Hindus and Musalmans keep up the practice of corresponding in Persian.

In the Census of 1901, of the total population of 3,210,910 persons, 2,734,356 gave Sindhi as their native language, 102,897 Balochki, 90,200 Gujerati, 30,976 Panjábi, 24,774 Hindi, 11,366 Marathi and 152,479 "Rajasthani." The last is practically equivalent to Márwári and Gujerati includes Kachi, so that 242,679 speak the languages of the countries east and south of Sind. Of these 93,000 are found in Thar and Párkar, 62,000 in the Hyderábád District, mainly in those talukas west of Umarkot and the chief routes through the desert, while more than 30,000 are in Karáchi town. Of the 102,897 classed under Balochki in the Imperial Census Tables, more than 45,000 gave Brahuiki as their language. Of these 19,000 were in the Karáchi District and the rest in Lárkána, Sukkur and the Upper Sind Frontier. The speakers of Hindi and Panjábi were chiefly in a few towns, such as Karáchi, Sukkur, Shikárpur, Jacobabad and Kashmor, and the Marathas were almost to a man in Karáchi.

Occupations.

The population of Sind in 1901 was 3,210,910. Of this number 614,930 were registered as field labourers and 647,765 as dependent on them, so that 1,262,695, or nearly 40 per cent. of the people, live by labour on the land. Under the head "Receivers of Rent" there were 120,167 and dependent on them 180,706, making 300,873, or nearly 10 *per cent*, living on revenue from land. A large host besides found a livelihood in connection with the care of cattle, sheep and camels. General (unskilled) labour supported

174,674 and mendicancy 120,762. A good proportion of the remainder were concerned in the distribution, on a petty scale, of all sorts of commodities. "Grocers and Dealers in Condiments," a term which seems to connote the village Bania, amounted to 34,559, with 51,972 dependent on them; and vendors of fruit, grain, pulse, pán-supari, milk, fish and a score of other things were registered separately. In the Karáchi District alone there were 2,582 persons engaged in selling betelnut and cardamoms. The classification of occupations adopted in the census tables is perplexing and very obvious errors of registration forbid reliance on the figures; but it is sufficiently clear that all the arts and industries together support but a small proportion of the people. The hands employed in power mills of all kinds are a negligeable quantity, but cotton weaving by hand supports 29,328. It is not so important as shoemaking, which maintains 31,566; but domestic service and washing clothes provide a livelihood for as many as these two industries put together and twice as many live by begging. Fishermen are much in evidence on the sea coast and the Indus, but it appears that those actually supported by fishing only constitute 25,000 of the whole population. **Occupations.**

Dwellings.

The climate of Sind is favourable to open-air life and large sections of the population, especially in the Delta, live under moveable shelters of reed mats, or of brushwood and thatch. Some scorn even so much and live under trees. But the ordinary villager has a low hut, consisting of mud, or wattle, walls and a roof of thatch, with a hedge round it enclosing his cattle-shed, which is also his reception room when friends call. In an emergency the cow will share his own hut with his family. His furniture consists of a cot or two, a mat, cooking pots and the hookah. From this the transition is gradual to the house of a zamindar, built of sundried bricks and with a flat roof. It consists of a "living room" (*suffo*), with one or two side rooms, which serve as box rooms and also receive the overflow at night if the family is large, or there are married sons. There should, if possible, be a kitchen (*randhno*), in default of which cooking must be done in the *suffo*, a store-room (*Sámán-ji-kothi*), bathroom and privy. The last is almost a necessity to Musalmans in towns and large villages. But the most important thing of all is the surrounding wall (*kot*, or *álampanáh*), enclosing the courtyard (*angan*). With a Musalman this comes first in order: inside it a shed will serve him

Dwellings. and his family until he can afford something better. But to live with any appearance of respectability a householder, whether Hindu or Musalman, requires also an *oták*, or drawing room, in which he may receive male visitors and pass the hours of the day. This is a separate building and contains the best furniture he has, cots with lacquered legs, swinging beds and perhaps even a chair or two. The houses of wealthier men are distinguished by ampler accommodation and more grandeur along the same lines, the residence of a great zamindar, or Pír, often having a castellated outer wall and several substantial buildings within. On the other hand many Baluchis have a superstitious fear of living in a solid building lest it should fall in on them, and for this reason, however wealthy they may be, they sleep and live in thatched sheds. The family of the Mír of Khairpur adhere to this practice. With the rise in the whole standard of living which is observable among all classes in Sind, houses built of burnt (*paka*) brick and even stone are becoming more common in the large villages than they were, and corresponding improvements appear in the arrangement and furnishing; but upper storeyed houses are still rare in the country. They are apt to be resented by neighbours the privacy of whose *pardah* they menace. In rural houses of the old type windows are regarded as superfluous, but windsails through the roof (*mangh* or *bád-gír*) are very common and almost a necessity. The flat roofs are not much used for sleeping, except in the north. Little of what has been said above applies to large towns, in which the houses are much more substantial, but necessarily have several stories and are crowded closely together owing to the timid centripetal tendency of Banias and shopkeepers. The Musalmans whose means admit of it seek single-storeyed houses with courtyards, and the rich of both creeds have many fine houses in Hyderábád and still more in Karáchi. These are often furnished quite after the European fashion.

Dress. In the dress of a Sindhi, whatever his creed, social position, or sex, may be, there are two indispensable garments, trowsers (*suthan*) and a shirt (*peherán*); and the shirt is worn outside the trowsers. Perhaps trowsers is not the right word: drawers would be better, or "pyjamas," for they are fastened with a cord of many colours, ornamented, even bejewelled: the making of these is an industry in Sind. If the statement that the two garments

mentioned are indispensable seem too sweeping, it must be admitted that the trowser is not a Hindu garment at all and hence the Bania and Brahman, especially in Upper Sind, still cleave to the national *dhoti*; but as surely as they get into government service, or become in any sense public men, they "are constrained," like Onoocool Chunder Mookerjee, "to veer the national dhotie for pantaloon." It must also be noted that the shirt, which varies greatly in shape and size, becomes sometimes what would be better described as a vest, or even as a compromise with a jacket. The indigenous trowser varies much in material and colour, but not in shape. The Baluchi "bags," narrowed and gathered in at the feet, are the fashion for all. The poor man's are of cotton dyed with indigo (unless he is a Baluch, who abhors indigo), the rich man's of silk, or cotton and silk, and white, coloured, or in some cases black. The shirt, usually of thin white muslin, opens on right breast if the wearer is a Musalman and on the left if a Hindu: its sleeves are wide and cuffless. Over this the Musalman likes to wear a fancy waiscoat (*kurta*) of velvet, or embroidered silk, over which he may, or may not, wear a long coat, of any material according to taste. The true Baluch puts on over all a long white smock, reaching to his ankles and gathered in at the waist, and no visible coloured garment except a *poshtin* in winter. A Hindu (*i. e.*, a respectable Bania or Bhátia,) does without a waistcoat, but wears, when he goes out, an "*angarkha*," or long coat, like that worn throughout India by men of any position at all and even by our own servants and peons. This is of white cotton in summer and of some warm coloured material in winter. Sindhi zamindars also wear warm coats in winter of broadcloth or tweed, sometimes brocaded or trimmed with gold lace or silk. Finally all classes wear a kind of scarf, which may be used as a "cummerbund," or thrown about the shoulders like a Scotch plaid, and has multifarious conveniences. If made of silk, with a border perhaps of gold thread, it is a *lúngi* for a prosperous Musalman; if of white cotton a *bochhan*. A coloured one such as Hindus affect is a *dupatta*. Shoes are more universally worn in Sind than in the Deccan or Konkan: those of the upper classes are often coloured and variously ornamented, those of the poor plain. Those of women are slippers described thus by Sir R. Burton—"A leather sole destitute of hindquarters, whose tiny vamp hardly covers the toes, its ornaments are large

Dress.

Dress.

tufts of floss, silk, various coloured foils, wings of green beetles, embroidered, or seed pearls sewed upon a bright cloth ground."

So far there is a general uniformity: the headpiece introduces more diversity and is the index of caste and creed. The Hindu wears an embroidered cap indoors, or in the north a simple white "topi"; but a turban when he goes out. If he is a Pushkarna Brahman, or a Bhátia, the turban is red, close-fitting, shaped like a pie-crust, with a very narrow projecting rim. In the north it has the "Multáni" shape, broader and not so neatly bound. If the wearer is a Sáraswat Brahman or a Lohána, it is the same but white, unless he is an Amil, in which case he will adopt the Musalman fashion and will appear on occasions of ceremony in the wonderful Sindhi hat, or "Sirái topi," made of velvet or kincob, (*kímkháb*), with a broad brim running round the top, like an English silk hat turned upside down. On other occasions he will wear a globular, amorphous turban (*patko*), white or coloured.

Some exceptions to these descriptions must be noted. When a Hindu adopts trowsers now, he generally follows the European cut. A Hindu in Baluchi bags is an uncommon sight in southern Sind especially, and in any case he does not wear indigo: that is the sign of a Musalman, Furthermore, fashions change even in the immutable east and an increasing number of educated men are adopting a shirt (*khamís*), coat and trowsers approximating more or less to the European pattern of those articles; so that in large towns it is rare to meet a man of any position who is dressed quite like an oriental. The *lúngi bochhan* and *dupatta* are gradually being banished by this change. The young Hindus are abandoning all other headgear in favour of a black velvet cap which is useful for no purpose whatsoever. The Musalman, who is less imitative, wears a fez preferably. Shoes have very generally conformed to the European pattern and socks are getting common. A railway porter has been seen going about in one sock, having lost the other. Even as regards what seems to be the most indigenous headgear changes have taken place. The Sindhi hat itself appears to have gone into and out of fashion very capriciously. Lieut. Pottinger found the Mírs of Hyderábád in 1809 wearing stupendous turbans in the morning, from 2 to 2½ feet in diameter and consisting of 80 yards

of fine gauze. But they put on the Sindhi hat at other times and a form of it, as appears from pictures, was the ordinary headgear of the Baluch soldiery. Then the Hindus in government service adopted it as a distinction. Now the Musalmans are discarding it and leaving it to the Amils, who are leaving it to the pleaders. **Dress.**

Women wear, in addition to the two indispensable garments, a covering for the head (*rawá*) which takes the form indoors of a thin veil. When she goes out a respectable Hindu woman puts on a petticoat (*peshgír*) over her trowsers, and both Hindus and Musalmans wear a *chádar*, or sheet, over the head and shoulders. This corresponds to the free end of a Maratha woman's *sari* and fences modesty. Pre-eminent modesty is indicated by a *burká*, which is an extinguisher of white cotton reaching to the ground, with a netted window in front of the eyes to enable the extinguished to see her way about; but this garment properly belongs to Mughals and foreigners. A Hindu woman's shirt is short, scarcely reaching below the waist, and has short sleeves: a Musalmani's reaches almost to the knees. The Brahui converts it into a gown of blue, or red, material going down to the feet, a most unbecoming costume for any woman, the effect of which is not improved when the enamelled iron bowl out of which she takes her meat and drink is worn on the head for a cap. A Hindu may be distinguished from a Musalman woman by economy in material. It takes twice as many yards to make a skirt for a Musalmani as for a Hindu. This distinction is striking in Thar and Párkar. Marathas, of whom there are many in Karáchi, wear the *dhoti* and their women the *sári* and *choli*, a neat, checked cotton bodice fastened in front. The Gujerathi and Márwári bodice, which leaves the back bare, is of course very common in Sind.

Finally it must be remembered that there are in Sind many races and many peculiar sects and as many varieties of non-descript costume. The clothes described above are the conventional dress of the major part of the Musalman and Hindu population. The difference between the upper and lower classes shows itself in the material rather than the pattern of their clothes. It must also be remembered that poverty cannot be in the fashion. A peasant's wife has little need for a *chádar* and a poor Hindu woman dispenses with trowsers, retaining the

Dress. petticoat. A poor man puts on what he can afford to buy, it may be the cast-off raiment of an alien, and wears it until it drops off him. There is an incredible trade in old clothes from Europe and the workmen engaged in the mills and workshops of Karáchi dress almost universally in shirt, trowsers and coat, of which the two last, if not all three, have unmistakably come from Moses and Co.

Ornaments are as indispensable to a Sindhi woman as clothes. The foremost in importance is the nose-ring (*nath*), which to a married woman is like a wedding ring, never to be removed while her husband lives. Nose-rings are of many forms, some suspended from either wing of the nose, some from the middle cartilage. They are large, sometimes ponderous, but the weight is borne by a plat of hair let down over the forehead. Smaller rings, such as girls wear, are called *búlá*. Ear-rings are also various: the whole rim of the ear is sometimes pierced so that from a dozen to twenty little jingling ornaments may fringe it. These also require support, which is afforded by fine silver chains attached to the hair. Necklaces, a frontal ornament for the hair, (*chindi* or *tiko*), rings on the fingers and toes (*mundi, & bandrá*), bracelets, anklets and armlets (*kangan kari* and *bánhrakhi*), with an amulet, (*táwis*), which may be on the arm or suspended from the neck, complete the decoration of a well-dressed lady. The glass bangles so commonly used elsewhere in India are unknown among Sindhis and the complete sets of thick ivory rings that sheathe the whole arm, so common in Gujerat, are being discarded by both Hindus and Musalmans here. Toe-rings and anklets are also going gradually out of fashion. Both these are of silver as a rule and bracelets also. For the others gold is to be preferred and jewels very much to be desired, but that is a question of means. A Hindu gentleman of means may have Rs. 5,000 invested in his wife's jewelry. There is little difference in the Hindu and Musalman fashion in this particular, but Hindus as a rule wear more jewelry than Musalmans.

Musalmans commonly shave their heads for cleanliness and coolness, but Baluchis let the hair grow long and those of the hills like to have it falling over their shoulders. No Musalman ought to cut his beard (Leviticus xix, 27), but many Patháns grow a military moustache and shave their chins, and the

Khojás have partly retained their Hindu custom in this matter.

Dress.

The Hindu religious rule for all castes, even Sudras, who are not ascetics, is to shave the head and face, excepting only the upper lip and a tuft on the crown of the head, called *choti* in Sind; but the Lohánas who took service under the Mírs and became Amils were compelled to wear their beards, like Musalmans, and have continued to do so. Banias and Brahmans are orthodox in this matter. As regards their heads, however, they, except Pushkarna Brahmans, let the hair on the sides of the head remain, shaving a broad lane through it in front of and behind the *choti*. The side hair is cut close and the front margin of it, on the temples, shaved to a curious, angular pattern. Amils do not do this; in fact many of them do not shave their heads at all. Those who follow the Sikh religion let their hair grow long and do not even shave as a sign of mourning.

Daily Life.

Human nature is much the same all the world over and the life of a Sindhi is not so different from that of an Englishman of the same station as we are apt to imagine. It is true that the intellectual interests and the sense of public duty which have grown out of education and culture among the upper classes in Europe have scarcely as yet infected the outer fringe of native society here. The country gentleman in Sind does not read the papers, take a part in local politics, or a seat on the committee of a literary, scientific, or philanthropic society, nor devote his leisure to archæology or entomology. It is also true that the Sindhi has a capacity for being happy without occupation of mind or body which the impatient Anglo-Saxon has difficulty in understanding or even conceiving. But, making allowance for these differences, their daily life runs very much the same course. The labouring man rises early and goes to his work, comes home to his midday meal, or takes it under a tree, and "forty winks" after it, then goes to his work again, comes back at dark, takes his evening meal and falls asleep. His wife rises as early, fetches water, grinds the corn, or cleans the rice, washes the clothes, milks the goat, serves her lord with his meal, minds the children and very generally adds to the family earnings by taking part in such outdoor work as reaping, cotton-picking, scaring birds, driving the water camel, &c., to say nothing of semi-domestic

Daily Life. occupations like gathering sticks or making cowdung cakes. This is "the trivial round" for seven days in the week and that relaxation which nature demands is found in the periodical religious festivals and fairs and in the festivities which signalise births, marriages and deaths in the little community. Many Musalmans, however, if their occupations admit of it, observe a sabbath on Friday, when they have their weekly bath and go to the house of prayer.

Those whose position, or occupation, allows them more leisure spend it chiefly in seeing their friends and talking, with perhaps a little cardplaying or music thrown in. The Musalman, unless he is very irreligious, begins the day with his ablutions, prayers and reading of the *Koran*, then indulges in social intercourse with his family, or friends, until he goes to his work. After that is over social intercourse begins again and proceeds until dinner and bedtime, with the accompaniment of the hookah of course and perhaps a draught of *bhang*. It does not follow because a man has leisure that his wife will. Respectability may forbid her to go out for water, but otherwise she has all the usual household duties. But in wealthy houses, where servants are kept, the ladies are said to live idle lives. They are much addicted, however, both Hindus and Musalmans, to fancy needlework. Many Musalman women are also regular in their devotions and even read the *Koran*.

Go a step higher in the social scale and we find that the old definition of a gentleman as a man who does no work still holds good in Sind. A wealthy Jágirdar, or Zamindar, of the olden time regarded hunting, hawking and cock-fighting as the proper occupations of a man of rank, and this way of thinking is not obsolete yet. When not engaged in any of these persuits a gentleman of position sits in his reception hall and smokes and talks, or else plays cards and enjoys the performances of musicians and dancing girls. The Baluchis have the credit of being the most idle of all the races in Sind, that is to say, the male Baluchis. Like honey bees, they have evolved a social system under which all the work of the hive is performed by the females, except fighting and cattle-lifting, from which they are now debarred.

Daily Life.

Hindus are by comparison with the rest of the population conspicuously industrious. Hoarding wealth and not spending it is a deep-rooted hereditary instinct with the Bania, and after the indispensable morning ceremonies of minutely cleaning his teeth and performing his religious duties, he is content to sit in his shop till near midnight, with only one interval for his bath, breakfast and post-prandial nap. Amils in service and others who have regular hours of business employ their leisure time before and after it in attending at places of worship, if religiously inclined, and in chatting, smoking or playing some game like chess. With Hindus it is a religious duty to bathe daily and most observe this, both men and women. Many Musalmáns bathe only once a week, and many, such as Jats and Baluchis, not at all without special reason.

Food.

The food of the people generally is simple. The agrarian classes eat the grain which is principally produced in the part of the country to which they belong. Thus *juári* and *bájri* are the staple food of those classes over a large part of the Province, but are displaced by rice in the region of the Delta and in the rice-growing parts of the Lárkána, Sukkur and Upper Sind Frontier Districts, while wheat is generally preferred by those who can afford it. Those who are well off do not use *juári* and *bájri* at all. Wheat, *juári* and *bájri* are eaten in the form of unleavened cakes, *i. e.*, "chuppatees," (Sindhi *máni*, or *roti*) made savoury with a little vegetable and spices, or curds and whey, or *ghi*, which Hindus prefer, and sometimes flesh or fish. Rice is boiled and eaten with some similar accompaniment, or made into *puláo* with meat. All classes eat flesh, fowl and fish, except the few Brahmans and Lohánas who adhere to the vegetarian diet enjoined by their creed, but here again circumstances decide the kind and quantity. With the Muhánas of the coast fish is the staff of life rather than rice, with the rustic inland the flesh of the goat may be indulged in once a week, with the nomad of Thar and Párkar wild ducks and other game are the favourite animal food, abundant at one time, but scarcely obtainable at another. The wandering Jats subsist very largely on the milk of their camels and the Baluchis of the Kohistan on that of their goats and sheep. Hindus refuse eggs, unless they have quite cast off the restraints of their religion, but Musalmans eat them freely,

Food.

fried or boiled. The diet of the upper classes, both Hindu and Musalmán, is of course more varied, including pulses, fruit and sweetmeats, as well as more vegetables than the poor can afford. The standard of living is said to have risen very much of late, especially among the Amils, meat being a daily item with many who would in former times have had it only once in the week. Hindus do not eat beef, which Musalmáns prefer to mutton, or even to goats' flesh. There are ordinarily two substantial meals in the day, one (*manjhand*) some time before noon and another (*Rát*) at 8 or 9 in the evening; but of course every man's habits in these matters have to suit his work. Clerks in offices must breakfast at 9 and they often take a "snack" of something on getting home from office in the evening. It is a common practice also, especially among the middle and upper classes, to take a light meal early in the morning corresponding to our "*choti hazri*." A drink of warm milk some time after the evening meal is considered beneficial: both Hindus and Musalmans take it. The use of tea is common, though not yet by any means universal, and it is at the early morning meal that it is generally taken, especially during the cold season. Coffee, strange to say, is scarcely used at all even by Musalmans. The use of spirits is very general among Lohánas, and country liquor has been to a considerable extent displaced by whisky and brandy. These are taken with water or sodawater, before the evening meal: drinking at or after a meal is not considered so wholesome. Drinking in the morning is regarded among them in the same light as it is by Englishmen generally. Among strict Musalmáns the drinking of wine or spirits is regarded as very reprehensible, and a large proportion of the Musalmáns of Sind are strict. But they use opium and intoxicating drugs (*bhang*) more than the Hindus generally. Smoking is all but universal, the hookah, often of enormous size, with a straight stem several feet in length, being the usual implement. The *bíri* is also smoked by some classes and the cigarette and even the cheroot are coming into fashion.

Amusements.

In Sind, as in the rest of India, it is a general truth that grown men do not play games. Ideas af decorum and dignity, both Brahminical and Mahomedan, tend to close this outlet for such superfluous energy as the climate of India permits These ideas

Amusements.

are fading away and youths of the coming generation are growing up with a healthy appetite for active games, but the games to which they are addicting themselves are cricket and tennis. There are, however, indigenous games, though they are not much in evidence. *Bilháro* seems to be a rough kind of "prisoner's base," *Gilí Dakar* is "tipcat" and *Tízí* a form of hopscotch. Dogboys and the syces' children play marbles in the alleys, and at the appropriate season young and old yield to the seductive pleasures of kite-flying. The strings of the kites are smeared with powdered glass and rival flyers aim to cut each others' strings and bring their kites to the ground, which imparts an excitement to the sport unknown in Europe. But the prime amusement of the adult Musalman populace is wrestling (*malákhro*). Wrestling matches are held on holidays and Fridays and are a feature of all fairs. Great men maintain famous wrestlers and get up matches. The best are said to be *Shídís* (Negroes). The next place may be given among national amusements to cock, partridge and quail fighting, which combine the excitement of gambling. Grand cocks are bred in Sind of the kind known in England as "Indian Game," the most obstinate fighters in existence. Grey partridges (the Black is of little account as a fighter) are caught young and become wonderfully tame. If they turn out prize fighters they are worth much money. Music is another favourite recreation. The lonely shepherd, or herdsman,

> "Patulae recubans sub tegmine fagi,
> Silvestrem tenui Musam meditatur avena."

Greater men, as in Europe of old, retain minstrels to entertain them. Between the two extremes the universal craving is supplied by the strolling ballad-singer, the piper and drummer at weddings and festivals and the chanter of sacred legends in the temples. The favourite instrument as an accompaniment to song is the *surando*, described by Sir R. Burton as "a rude form of the violin, with four or five sheep-gut strings, which are made to discourse eloquent music by a crooked bow that contains half the tail of a horse." It appears to be an instrument of Baluchi origin, the *sitár* being the Indian equivalent. The *yaktáro*, or one-wire, is a simple gourd guitar known all over India. The *murli* is an embryo bagpipe, with an air reservoir made of a

Amusements.

gourd, and the *nar* is the common straight pipe. There are many others. With rustics dancing is also a favourite amusement, and the Sindhis are said to have some pretty dances. The *nách* retains its place among Musalmans as a ravishing delight, but is said to be going out of favour among educated Hindus and is expensive, as Nách-girls have to be brought from the Punjab. In the north the Hindus delight to watch a *bhagat*, a performance in which Bania men dance and sing religious songs to the accompaniment of drums.

Of indoor games chess (*shatranj*) is said to have been invented in Sind and there are some famous players of it in the towns. *Dháro*, or *chaupar*, a game played with dice on a board, or rather a cloth, and several games played with cards, which afford opportunities of gambling, are common. Among country people setting and solving riddles is a favourite pastime, as in the days of Samson.

All Baluchis are passionately devoted to field sports and in the days of the Mirs the *Shikárgáhs*, or game preserves, which occupied the banks of the Indus almost from Sehwán to Tatta, were places of inviolable sanctity. When stipulating for a clause securing these preserves from violation in the treaty of 1839, one of the Mirs said to Colonel Pottinger, "We value them as much as our wives and children." Their methods of sport were not such as could afford any excitement to an Englishman. The sportsman was seated in his shooting box opposite to a gap in a hedge, through which the close-packed herds of hog-deer were driven, to be slaughtered at close quarters amid acclamations of victory. Duck and waterfowl were shot in the same way. Nevertheless the Baluchis were extraordinarily skilful in the use of their matchlocks. Colonel Pottinger tells of larks and other little birds hit unerringly with a single ball at 50 or 60 yards. Another weapon with which they made marvellous practice was a a bow of horn with blunt-headed arrows, which were discharged so as to hit the bird not with the point, but transversely. The love of sport still pervades the whole Musalman population, but the clearance of the jungles and wide-spread destruction of the game has left very limited scope for the indulgence of it. Many of the Zamindars are keen sportsmen, however, and good shots with a rifle, but few are expert with the shot gun.

The Mirs and wealthy Zamindars were also and still are devoted to the "gentil art" of falconry, which they have brought to as great perfection as it ever attained in England in its palmiest days. The following are the hawks and falcons chiefly used, with their native names, which are different for the male and female of the same species, as in Europe. **Amusements.**

Yellow-eyed, or short-winged, hawks.

Goshawk, (*Astur palumbarius*), female *Báz*, male *Jarra.*

Sparrow Hawk, (*Accipiter nisus*), female *Báshá*, male *Báshin*: *Báshin* is the feminine form, but is applied to the male bird, perhaps because it is smaller.

Indian Sparrow Hawk, (*Astur badius*), female *Shikra*, male *Chipak.*

Black-eyed, or long-winged, hawks, *i. e.*, falcons.

Peregrine Falcon, (*Falco peregrinus*), female *Bhairi*, male *Bhairi-bacha.*

Shahin Falcon, (*Falco peregrinator*), female *Kohi*, male *Kohila.*

Saker, (*Falco cherrug*), female *Chargh*, male *Charghela.*

Laggar Falcon, (*Falco jugger*), female *Laggar*, male *Jaggar.*

Red-headed Merlin (*Æsalon chicquera*), female *Turumti*, male *Chetwa.*

The *Báz*, or female goshawk, is the most highly prized by Indian falconers of all hawks. It is caught in the Himalayas, or Khorássan, and is worth, when trained, Rs. 50 or 60. It is used to kill houbara, kites, herons, ibises, &c., but is especially trained to kill hares. It is thrown from the hand, as are the Sparrow-hawk and *Shikra*. These, especially the former, are chiefly used for killing partridges. The *Shikra* is a resident Indian bird and very common and cheap: the other is a cold season visitant.

Of the falcons none (except perhaps the Shahin) compares with the Peregrine, which is trained to strike herons, cranes, storks and wild duck. The *Chargh*, a larger bird, is used, like the Goshawk, after hares and is sometimes trained even to assist dogs in the chase of the gazelle, which it strikes boldly on the head and face. The dogs are greyhounds from Kalát, where they

Amusements.

are carefully bred. No attention appears to be paid to the breeding of dogs in Sind. The Shahin falcon is very highly prized and is used after florican, stone-plover, the houbara and partridges. The *Laggar* is the only one of the falcons above-named, except the tiny *Turumti*, which is resident in India, and it is not much esteemed, but it gives good sport with crows.

Horse racing is another sport of which Baluchis are passionately fond. The annual races at the Horse-shows at Jacobabad and Shikárpur are attended by excited crowds. They also get up frequent sweep-stakes among themselves.

Musalman Festivals.

The principal Musalman festivals are *Muharram, Ashúra, Báráh Wafát, Shab-i-barát, Ramzán Id* and *Bákri Id.* As these are regulated by the lunar months, they are moveable feasts in our calendar. The Shias differ from the Sunis as to the days on which two of them should be observed.

Muharram. This bears the name of the first month of the Musalman year, on the 10th day of which Husain, the son of Ali and grandson of the Prophet, fell fighting against the Khalifa Yazíd at Karbala on the Euphrates, in the year 680 A. D., and is observed in commemoration of him and also of his brother Hasan, who was poisoned some years before at the instigation of the same Yazíd. Among Shías, who regard Yazíd as a usurper and Hasan and Husain as martyrs, it is a season for deep and solemn, or even frenzied, grief. The Suník also consider it proper to mourn on the occasion, but in moderation. The mourning commences ten days before the anniversary and *Taaziáhs,* or *Tábúts,* that is, models of the tomb of Husain at Karbala, are prepared in many houses, sometimes in very imposing and expensive styles. The Mírs who are Shías and the Sayads of Rohri, Sukkur and Shikárpur are lavish in their expenditure on these. During the ten days of mourning the religious do not work, but dress in black and devote themselves to lamentation and prayer and listening to reciters of the moving story. On the tenth day the *tábúts* are taken in procession to the sea, or a river, or lake, and thrown into the water, after being thriftily stripped of their more valuable decorations. The mummeries which accompany these processions in India and are the chief delight of the attendant rabble are of heathen origin and are disapproved by enlightened Musalmans.

Musalman Festivals.

Ashúra properly indicates the first ten days of Muharram, but is commonly used for the 10th day, which has a second ground of sacredness as the day on which Adam and Eve were created. Many Sunís therefore fast on this day, following the example of the Prophet.

Báráh Wafát, or *Id-i-Maulúd.* This is the anniversary of the Prophet's death and is celebrated by the distribution of alms and cooked food (*urs*). The Sunís observe it on the 12th of the third month, *Rabi-ul-awwal,* but Shías on the 17th.

Shab-i-barát, the night of record, is the evening of the 14th of *Shaában,* the 8th month. On this night the destinies of unborn souls are registered in heaven, therefore it is devoted by many Sunís to public worship. It is also celebrated with illuminations and fireworks and distribution of sweets among friends.

Ramzán. The 9th month *Ramzán,* in which the revelation of the *Koran* began, is the Lent of Islam, during which no good Musalman should let food or water pass his lips between dawn and dark. He may eat and drink as he likes in the night and the common practice is to take two meals, one after the stars appear and the other some time before dawn. When *Ramzán* falls in the hot season, this is a very severe ordinance, but it is literally obeyed by multitudes, both Shía and Suni, in this religious province. The sight of the new moon at the end of the month closes the fast and brings in the *Ramzán Id,* which is the Easter Day of Musalmans and one of the two greatest festivals in the year. After an early meal of such light refreshments as vermicelli and milk, the whole community, bathed and clad in clean apparel, assembles at the *Idgáh* for prayers and sermon. Alms are distributed to sanctify the fast.

Bákri Id, the Goat Festival, commemorates the offering by Abraham of his son Ishmael (not Isaac, as in the Bible account, who has little interest for Musalmans) and his deliverance through the intervention of the angel Jibraíl with a lamb. It is observed by attendance at the *Idgáh,* after which every family or individual should sacrifice a goat. Most content themselves with keeping the spirit of this rite by buying mutton in the market. Curiously enough, those who do sacrifice observe the Passover

Musalman Festivals.

practice of sprinkling their outer doors with the blood of the victim. Both Shiás and Sunís observe this.

Hindu Festivals.

The Hindu holy days are very numerous and the various castes differ much in the relative importance which they ascribe to them. The following are recognised by Government in Sind. They are given in the order of the Hindu year.

Chetichand, Cocoanut Day (*Narel Púnah*), *Gokal Ashtami, Dasahrá, Diváli* (*Diári*), *Makar Sankránt, Mahá Shivrátri* and *Holi.* For the rest of the Presidency, but not for Sind, the following are also recognised:—*Rám Navmi, Ganesh Chaturthi*; and many in Sind consider these important.

Cheti Chand. This, the first day of the first month in the Hindu year, is observed, like our New Year's Day, chiefly by the Daryápanthis, who hold fairs at Uderolál and Zindpír. It is not one of the holy days of Hinduism.

Rám Navmi, which falls on the 9th of the same month *Chet,* is the birthday of Ráma and a great day among his worshippers, but, except among Marathas and Gujaratis, he has scarcely any in Sind.

Nárali Purnima (or *Nárel Púnah,* as it is pronounced in Sind), which is the Marathi name for what we call Cocoanut Day, is another day not indigenous to Sind, but observed by many in Karáchi. It is the full moon day of the month *Sáwan* and, falling some time in August, closes the monsoon theoretically. So mariners offer cocoanuts to the sea on that day and then launch their boats for the season.

Gokal Ashtami, or *Janmá-ashtami,* which falls a week after Cocoanut Day, is the birthday of Krishna, the most popular of all the Hindu gods, and accordingly the day has been made a Bank Holiday; but it is of little account in Sind, where Krishna has a very small following.

Ganesh Chaut or *Chaturthi.* The same may be said of this day, which commemorates the birth of Ganesh, the elephant-headed god of wisdom. Little is seen in Sind of the gaudy clay images of the god which are carried to the sea with so much pomp in Bombay. It falls on 4th of the month *Bado* (*Bhádrapad*), that is, August or September.

Dasahrá, the 10th day of the following month *Asu* (*Asvin*= September—October), was the day on which Ráma paid his devotions to Durga Devi before setting out to recover his wife Síta from the demon Rávan, who had carried her off to Ceylon; and there are two other great events of bellicose mythology associated with the same day. Hence it became the lucky day all over India for kings to go forth to battle; and on it Kshatrayas and Marathas took their weapons from the tree (in Sind a *Kandi* tree) under which they had been hidden during the monsoon and worshipped them. It was a great day also for Banias (army contractors and the like) and all camp followers, who joined in the worship. In these "weak, piping times of peace" only the shadows of the ancient rites remain, but the auspicious day is still observed with great rejoicing. The *syce* decks his master's war horse and comes to the front door to make a lucrative *salaam*, the Bania goes to worship at the *kandi* tree, and so on. There is generally a particular *kandi* consecrated to this purpose. In Karáchi it is a large one in the compound of the Pinjrapur. **Hindu Festivals.**

Diwáli (*Dipa-awali*=a row of lamps), called *Diári* in Sind, covers several days and includes more than one, originally distinct, festival, involving the worship of Vishnu, his wife Lakshmi, the goddess of wealth, prosperity and splendour, and Saraswati, the goddess of learning. It is therefore especially a festival of the Vaishnava sect, to which a large proportion of the trading castes of western India belong, and has come to be a kind of business New Year's Day, on which they worship the past year's gains, with the blessed ledgers which record them, and open and consecrate new accounts and fill their inkbottles with fresh ink. They clean, decorate and illuminate their houses, let off fireworks and make a lavish distribution of sweetmeats. They also abandon themselves to gambling in token no doubt of their faith in the goddess of good luck.

Makar Sankránt. This is a solar festival, occurring on the 13th of January. It marks the passage of the sun into the sign *Makar*, or Capricorn, and the winter solstice. It is observed by Brahmans and allowed by Government as a special Hindu holiday.

Mahá Shivrátri, held on the 14th of the dark half of *Mángh* (January-February), is a great day with the votaries of Shiva, who

Hindu Festivals. are few in Sind. They repair to his temple, sprinkle water and flowers on the *lingam* and fast and bathe in the river or sea.

Holi, the Saturnalia of Hinduism and the most widely popular of Hindu festivals, which occurs at the full moon of *Phagun* (February-March), is happily observed in Sind with little of the enthusiasm which it evokes in more orthodox parts, but its main features, the buffoonery, obscenity and drunkenness, are the same, and *gulál* (red powder and the liquid made from it) are freely splashed by the worshippers on each other and their god. In the popular mind it commemorates the amative sportings of Krishna, but it probably originated in the celebration of the vernal equinox.

Besides these there is a festival, peculiar to Sind, called *Thadri*, observed by all classes of people, but not recognised by Government and of which those who observe it seem unable to give any account. The women celebrate it by attendance at the temple of *Devi* and by eating sweet cakes baked on the previous day, and the men by gambling, which accounts for its hold on the community. It falls on the 7th day of the dark half of *Sáwan*, *i. e.*, in August.

CUSTOMS—MUSALMAN.

Customs, Musalman The ceremonies connected with the epochs of human life, birth, marriage and death, in the Musalman and Hindu communities, are as different as the religions professed by the two; but in the two principal sections of the Musalman community, the Suni and Shia, there is no essential difference. The ceremonies connected with entrance into life and the Muslim faith are three, *viz.*, naming, shaving the head (*akíko*) and circumcision (*khutno*).

NAMING. As soon as possible after the birth of a child the father, or in his absence an uncle or other elderly relation, repeats in his or her ear the formula which begins the call to prayer, "Allah is great," in order that the name of God may be the first sound that it hears in this world. Immediately after this the father gives it its name.

SHAVING. On the 7th, 14th, 21st, or on the 40th day, the child's head is shaved with some curious ceremonies which appear to be symbolic of a sacrifice of atonement. Two goats without spot or blemish

are killed in the case of a boy, one in the case of a girl, after the Mulla has repeated in their ears a formula to the effect that they represent the child in every part of them. Then the flesh of them is cooked and distributed among relations and friends, but the bones are preserved unbroken (see Exodus, XII, 46) and solemnly buried in a selected spot (sometimes within the house) *along with the hair of the child.* The hair is first weighed against silver or gold, which is given in charity. The relations present at the ceremony wave money round the child's head and this (called *ghor*) becomes the barber's fee.

Customs, Musalman

CIRCUMCISION

No age is prescribed for circumcision. Rarely it is performed on the 6th day after birth, but generally when the child has grown to boyhood. Poor people are tempted to postpone it on account of the expense. On the day of the ceremony the boy is dressed and garlanded and taken round the town, on horseback if means permit, to the sound of drums. Then the rite is performed by the barber in the presence of relations and friends. The barber's fee is placed by the father under the boy's right foot, in addition to which he gets the boy's old clothes and the whole, or part of, any money (*ghor*) which friends may wave for luck round the boy's head. In the north there is a curious custom of averting mischance during the operation by making the anxious mother stand with a millstone on her head while a male relative pours water on it. The precautionary intention of this practice would seem obvious, but in the south it is varied by making the father stand instead of the mother, with his feet in water and a Koran on his head. After the recovery of the patient, *i. e.*, on the 11th day, it is incumbent on the father to feast a wide circle of relations and friends, which may cost even a humble man 50 or 100 rupees, while the rich can spend thousands on it. But each guest is expected to bring a small money present (*pahat*) and a popular man may find his expenses recouped in this way.

MARRIAGE.

When a young Musalman in Sind desires a wife, the proceedings towards the accomplishment of that end are very similar to those which brought Isaac and Rebekkah together 38 centuries ago. He seeks first within the circle of his own family connections or, that failing, within his own tribe. If he goes outside of it, he must marry beneath him, for no self-respecting father will give his daughter to a tribe which is socially below his own.

Customs, Musalman

The daughter of a Sayad can marry only a Sayad and so on down the ladder. But the matter has a commercial aspect too, and of some tribes, particularly the Patháns and Brahuis and the more degraded castes, such as the Máchhis and Mirbahars, it is said that their daughters are sold to the highest bidder. Of course the young man cannot act in the matter himself. The go-between is usually a woman of good repute; if a Sayad, so much the better. When it has been ascertained through her that the father of the girl in view is well disposed, an offer is made and usually has to be repeated once or twice; for it would not be becoming to seem to jump at it. Then on an appointed day the bridegroom, with his father and mother and a family party and a band of musicians, proceed to the house of the bride carrying sweetmeats and presents. When they have seated themselves, the men with the men and the women in the women's apartment, the barber's wife is sent to the former with a tray of sweetmeats and a pot of milk. When they have eaten and drunk and established mutual cordiality, the *fátihah*, or opening chapter of the Koran, is recited by all with raised hands, and the betrothal (*mangno*) is complete. The nose of the bride is pierced for the ring which she will wear at her wedding, unless she belongs to one of the few tribes who do not wear that ornament. After this it is considered a little dishonourable to break off the match and the two families continue to exchange presents by way of keeping up the *entente cordiale.* But matches are sometimes broken off, especially when the betrothal of a boy and girl has been arranged in their infancy, or before their birth. Many lawsuits spring from this cause. However early the betrothal may have been, the marriage ceremony is not usually performed among respectable people until the girl and boy have arrived at adolescence: it is earlier in villages than in towns and is apt to be hastened by the anxiety of a fond mother to see her son "settled".* The approach of the wedding day is indicated for perhaps a month beforehand by pipes and drums and merrymaking. A week before the event the beautifying and sweetening of the bride (*wana-wáh*) begin. She keeps to her own room, wearing a veil sent by the bridegroom, and is fed on *Chúro,* "an unleavened cake of wheaten

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*Census returns show that the majority of girls, of all classes taken together, are married before the age of 10, but possibly all who are betrothed are returned as married.

Customs, Musalman

flour made into dough with clarified butter and mixed with brown sugar—a bilious mess, popularly supposed to increase the delicacy of the skin." (Sir R. Burton.) The barber's wife attends her daily, bathes her, rubs her with wheat flour and oil, blackens her eyes with *kajjal* (lamp black), dyes her lips with *muság* (walnut bark) and her palms and soles with *mendi* (henna). Three days before the wedding the bridegroom is similarly prepared by the barber and then taken round the town on show, on horseback if they can afford it. The feasting of the friends and relations begins after this. On the evening of the wedding day the bridegroom is again groomed by the barber and dressed in clothes presented by the bride's father, while the bride is apparelled and arrayed in the presents of the bridegroom; then the bridegroom's party proceed to the bride's home, where a *Mulla* is present. Three of the nearest of kin on the bridegroom's side and three on the bride's take an official part in the ceremony, one being termed the "vakil" and the others witnesses. The ceremony is simple and begins with the timeworn questions, "Wilt thou have this woman?" and "Wilt thou have this man &c.?" repeated three times and duly responded to in the affirmative. The bridegroom makes his own response, but the bride is answered for by her father or mother, or even aunt or sister, if her high birth makes it unbecoming for her to be present in person. Then the marriage settlements are made and duly recorded by the witnesses, after which the *Mulla* reads the appointed passages from the Koran, the bridegroom repeating the words after him. This concludes the ceremony (*nikáh*) of marriage and the *Mulla* congratulates the bridegroom and receives from his father the costly gifts which take the place of the fees that he may not accept. After the wedding there is the nocturnal procession through the town, with which the long-suffering public is already too familiar, and then the party returns to the bride's home, where amusing ceremonies, not enjoined by religion but sanctioned by custom, are gone through. The most indispensable of these is (*mathá-mer*), the knocking together (gently) of the heads of the bride and bridegroom by a married lady of the family as they sit opposite each other, she to the east and he to the west, with a pillow between them. The ruinous expenses of a marriage, apart from the dowry which the bridegroom is bound by religious law to settle on the bride, consist chiefly in the feasting

Customs, Musalman

and the numerous presents which the father of the bridegroom is required to make to relations and friends on peril of losing his character as a gentleman. The guests contribute something towards the feasting expenses by the small money presents which they all bring, as they do at a circumcision, and the wealth expended on presents is kept, as far as possible, from going out of the family by the common practice of exchanging brides. When a girl of one family has married into another, some male relation of hers obtains a wife from her husband's family in return. So the marriage gifts are mutual and the money spent on them is not quite lost.

After her marriage a woman is supposed (allowed by religion) to visit her parents every Friday till her first child is born. A Musalman is allowed by his law to have four wives, but only the wealthy avail themselves of this right. Of the common people very few have more than two and many only one. The nobility commonly keep concubines as well as wives and lose no credit by it. Divorce is common, especially among the lower classes, being obtainable by a simple form and on trivial grounds. There is no bar to the marriage of divorced women or widows. Among Baluchis infidelity in a wife is not dealt with by divorce, but by killing her and her paramour. This is regarded as the only way in which the husband can recover his tarnished honour, and so strong is the feeling on the subject that it has been found necessary to provide for a modification of the action of our criminal law in dealing with crimes of this nature among Baluchis.* The *pardáh* system prevails among respectable Musalmans in Sind, and certain sects, the Sayads, Mughals and some Baluchis, Tálpurs particularly, are extremely jealous of letting their women be seen; but the working classes go about with perfect freedom and do not take as much trouble as any ordinary Maratha woman does to veil their faces from a passing stranger.

DEATH.

When a Musalman is at the point of death a few drops of honey are dropped into his mouth and relations standing round him read appropriate passages from the Koran and repeat the creed and prayers for forgiveness. It is considered a sad thing to die where there is no one competent to do this. After death the eyes and lips are closed and then the body is carefully and

* By Sind Regulation No. III of 1892

Customs, Musalman

thoroughly washed by a *ghasal,* a *Mulla* whose particular office it is, after which it is wrapped in a shroud called *kaffan* (coffin ?). Rosewater and perfumes are sprinkled over it and it is laid on a bier and covered with a shawl, a copy of the Koran being placed at its head. The bier is carried to the burying ground by four of the nearest kinsmen of the deceased and followed by the mourners, chanting as they go, La-illaha-illa-allah, "There is no God but one God." If practicable, they visit a mosque on the way, where prayers are offered. In the grave a hollow is dug, into which, after all present have prayed for the peace of the soul, the body is laid on its side, with the face towards Mecca. The grave is then filled, the company repeating the verse, "From the earth we created thee and into the earth we return thee." The *Mulla* then repeats the creed. On the third day a feast is given at the house of mourning, after prayers and the reading of the Koran. The same thing is sometimes repeated on the tenth day and other days, but a feast to all relations on the fortieth day is usually the conclusion of the period of mourning. Rich men employ *Mullas* to read the Koran at the grave for forty days and after that sometimes for years the memory of the departed is kept up by praying and reading on occasions at his tomb, but in any case the *Bárho,* or anniversary ceremony, one year after the death, must be observed.

The ceremonies of the Khojas, Boráhs and Memans differ in many points from those described above. The Khojas in particular surround a Mahomedan kernel (*e. g.* the *Nikáh* ceremony in marriage) with a mass of customs derived from their Hindu ancestors.

Customs—Hindu.

Customs, Hindu.

The following account of the ceremonies with which the principal events of a Hindu's life are celebrated refers to the Lohánas who constitute the great bulk of the Hindu population, and who, whether they call themselves Nanakshábis, or Daryapanthis, or follow any of the various sects of Hinduism, employ Brahmans on all such occasions. The rites observed by Brahmans themselves are similar, but in some degree more conformable to the precepts of the *shástra.* Of the other Hindu castes represented in Sind each has its own rites, and even settlers from other provinces follow the customs which they brought with them and not

Customs, Hindu.

those which they find here: to give even the briefest outline of these would take more space than can be allotted to the whole subject.

BIRTH.

When a child is born the first thing to be done is to communicate with the family priest (*Purohit*) in order that the exact time may be noted. Before clocks and watches became so cheap it was part of his duty to ascertain the time astronomically and Brahmans were often called to the house when the event was expected that they might be in readiness. It is a common practice to hang an onion, or a spray of *nim*, at the door of a house in which there has been a birth, to avert evil.

NAMING.

The *Chhati* ceremony, at which the child receives its name, is held on the 6th day after birth. Relations and friends assemble at the house and the Brahman, after reciting *mantras* and worshipping the planets, declares the horoscope and then announces the child's name. Sweets are distributed and the Brahman receives his fees.

TONSURE.

Though adult Lohánas of the Amil class absolve their own heads from the control of religion, they shave their male children with due solemnity at the age of thirteen months. This is called *Munan* and the repetitition of it at three years is *Par-munan*. It may be repeated again at any age in pursuance of a vow by the mother. The rite is usually performed at the place of worship of the parents, but many who are not Daryapanthis do it nevertheless at Uderolál, or on the river bank. Sometimes it is done under a *Kandi* tree at the *Dasahra* festival. The meaning of this is obscure. Guests bring small offerings of money, which go to the barber. After being shaved the child is bathed and dressed in new raimant. The payment of his dues to the officiating Brahman constitutes of course an essential part of the religious merit of the performance.

THREAD CEREMONY.

The ceremony of investing a boy with the sacred thread (*Janio*), which admits him into the pale of Hinduism, is religiously performed by Lohánas. It is done at the ordinary place of worship, or at Uderolál or the river, as above, and at any age between 5 and 12. If there is a family marriage in prospect, it is combined with that in order to reduce the heavy expense of the feasts which are inevitable on both occasions. The cost of the

Customs, Hindu.

gifts of clothes and money which it is incumbent on the father to make to married sisters and daughters and other relations, and which may amount, in the case of a man in comfortable circumstances, to several hundred rupees, cannot be avoided.

The present generation in Sind has not leisure for the elaborate solemnities proper to what is really the "confirmation" of a Hindu boy, and accordingly they are much abridged in practice and gabbled over. The boy bathes, shaves and seats himself opposite the priest, who repeats to him the words which he ought himself to repeat, including even the sacred verse *gayatri*. He worships Ganesh, or Ganpati, offers the burnt offering (*hom*) of barley, sesame, sandalwood, sugar, *ghi* &c. and is then dressed in a *langoti*, furnished with a staff, wallet and begging bowl, invested with the sacred thread and sent on the round of mendicancy, pilgrimage and learning which constitute the second stage in the ideal life. He does the first of the three duties literally by asking money from his relations and giving it to the priest, and the second symbollically by a short walk: the Educational Department attends to the third. Only the Brahman, Kshatraya and Vaishya castes are entitled to wear the sacred thread, but many castes of Shudras do it and have their own rites. Sikhs, on the other hand, who are really Sikhs and wear their hair long, abjure it.

BETROTHAL AND MARRIAGE.

In matrimonial affairs among the Lohánas the first advance must come from the side of the young lady: the swain cannot propose. Necessity has no law, however, and where there is a dearth of marriageable girls a young man may be driven to take the leap-year privilege, but the opposite is the proper course. When a girl comes to the marriageable age, which lies between 10 and 13,* or some time before it, her mother fixes her choice on an eligible young man of 15, or thereabouts, and sends a proposal through a lady ambassador, or a Brahman or *Báwa*. There are probably other offers of the like kind and the young man's mother, after considering them all with reference to the position and character of the families, the amounts of the proposed dowries &c., and consulting her husband, his relations &c., intimates her acceptance of one. The parents of the girl

* Census returns show that many thousand Hindu girls are married before 10 and most of the remainder before 15: among boys there were more marriages after 15 than before it.

Customs, Hindu.

respond by sending a tray of sugar candy, with a small sum of money, which appears to be a handsel of the bride's dowry, for when the young man's family has accepted it and eaten the sugar-candy, the betrothal is complete. But there is diversity of practice in this matter: in Karachi a Brahman is often sent to seal the contract by imprinting the *tilak* on the young man's forehead and giving him a cocoanut. After this instalments of the dowry and presents of sweets, cooked grain and in Hyderabad and some other towns even wine pass from the bride's to the bridegroom's family until the day of the marriage. Among the Brahmans this does not appear to be the practice: settlements are all made at once at the time of the marriage. In either case the whole dowry, whether it consist of cash, apparel, or ornaments, is given by the father of the bride and goes into the family property of her husband's father. The nose-ring alone is sometimes given to the bride herself by her mother. The feasting expenses, however, fall on the bridegroom's family.

The first step towards the celebration of the marriage is the ascertainment of a lucky day. The months of *Sáwan* and *Bada* are propitious, *Asu* is not: with respect to the rest the *purohit* must be consulted. A week, or weeks, before the day fixed on a temporary banqueting house is prepared and the

"ear-piercing pipe and spirit-stirring drum"

call upon the whole village to eat, drink and be merry.

In large towns this all-embracing hospitality is of course impossible, but the circle of friends and acquaintances who expect invitations is very wide; and in large towns, especially in Hyderábád if the host is an Amil, the good things provided for the guests will include *puláos* of meat and wines and spirits. When the lucky hour approaches, the bridegroom appears, attired in a wonderful façade of paste-board decorated with flowers of coloured paper, or sometimes made entirely of silver, called a *mutik,* and, mounting on a mare, starts for the bride's house, accompanied by his friends, pipers, drummers, torch-bearers and men that let off fireworks. At the bride's house he is received with due ceremony into the *angan*, over which a canopy has been erected, where he has a bath and puts on wedding garments presented to him by the bride. The mother of the bride washes his feet with water or milk. Then he goes into the inner chamber,

Customs, Hindu.

where the women are, and comes out leading his bride by the hand and with the corner of his skirt tied to hers. In some places he does not come out, but the ceremony is performed in the zenana. The couple sit on two stools, side by side, with the family priests in front of them. The priests recite the *sapta-padi* and then the bride and bridegroom walk four times round the sacred fire, on which the priests have already made the *hom* sacrifice. The joining of hands (*hathiálo*) and the circuit of the fire (*pherá*) are the essentials of the marriage rite. After it is over gifts are distributed to relations and the officiating priests are not forgotten ; then the bridegroom, mounting his mare again, but this time with his wife behind him in a *doli*, goes in joyful procession to his father's house. Next day the father of the bride gives a feast. A Hindu as a rule has only one wife, but if she remains long childless, he takes another. Divorce is unknown among them, though in some places, notably Shikárpur, unfaithfulness is very common. So is remarriage : the widow remarriage movement has made no progress in Sind. In 1901 there were 18 widows in Sind under 5 years of age and 137 under 10.

DEATH.

When the end of a Hindu is seen to be approaching he is laid on a ground floor which has been smeared with cowdung and a few drops of Ganges water are put into his mouth. If it cannot be had, water sprinkled over a *tulsí* plant is a substitute ; but sometimes sherbet is used, which looks like a Mahomedan contamination. He is then bathed before life is extinct. If he dies on a bed, or unbathed, the Brahmans will refuse to partake of the 12th day feast until expiatory rites called *naráíni-balí* have been performed for him. As soon as possible after death the body, shrouded in a *kafan*, is laid on a bier of tamarind wood, with rich coverings if the family is wealthy, flowers are sprinkled over it and the bier is borne to the burning ground by the four nearest of kin, one of whom is the heir (*piní-wáro*). They are relieved on the way by others. All have their heads and faces shaved. As they go they cry " *Har nám sang hai,*" that is, " the name of God is with you." Singing *bhagats* and musicians accompany them. Arrived at the *masán,* they lay the body on the pyre, the man in charge (*masáni*) pours a little water over it, and the four who first lifted the bier light the pyre at the four corners. The mourners bathe and return. The ashes are not thrown into the river or sea until the third day after. Sometimes

Customs, Hindu.

they are kept and sent to the Ganges when convenient. For the first three days after the death friends come to offer condolence. On the 12th day Brahmans are fed and the mourning is over: the relations of the deceased may shave and eat meat and drink wine. After a month and a half, six months and a year there are repetitions of the ceremony of feeding Brahmans. After that the anniversary of the deceased is observed in the same way. Infants under twenty-seven months of age are buried instead of being burned, and so are Sanyásis. All other Hindus (except the outcastes) are burned.

Joint Family System.

The joint family system prevails throughout Sind, except among Baluchis, but it is by no means universal and is becoming less so. The Hindus especially show a disposition to abandon it, even sons commonly separating from the father when they can support themselves.

Superstitions.

The Sindhi appears to have inherited all the common superstitions of the human race. The howling of a dog and the hooting of an owl bode evil to him and his house, the sight of a shoe upside down fills him with apprehensions; but if the cat licks its paws and washes its face, he knows that a friend is coming to visit him, and the itching of his palm is a pleasant token that needs no interpretation. If, when setting out on any business, he meets a corpse, there is good luck awaiting him; but if he meets a sweeper, or a jackal, he may as well turn back. The calling of a partridge must be interpreted with discrimination, or no business could proceed where partridges are so ubiquitous and vociferous. Those who understand say that in the forenoon it is lucky on the left and unlucky on the right, but in the afternoon these conditions are reversed. How standard time affects the matter has not been settled yet. A hiccough shows that some friend is thinking of the sufferer: if he recollects his friends one by one, the hiccough will stop as soon as the right one comes to mind.

There are lucky and unlucky days of course. A man who shaves, oils his body, or puts on clean clothes, on Tuesday will shorten his life, and there are many other days the effects of which are fixed and well-known; but the days which are propitious for the commencement of any important undertaking can be ascertained only by the stars, and these are understood only

by Brahmans and *Mullas.* The belief in dreams is also very general and the gift of interpreting them is found with old women. **Superstitions.**

Eclipses are baneful, especially to unborn children. Therefore cautious parents go to bed and lie still while an eclipse is in progress, lest any thoughtless act, such as mending a pen, cutting a stick, or striking a dog, should leave a permanent scar on expected offspring.

Mahomedan superstitions gather very much round evil spirits, *jins* and fairies. Spirits haunt graveyards and fairies on moonlit nights cast their shadows on children and on brides and bridegrooms. Insanity is a probable result. The means of averting these and all malicious influences are, in the case of Musalmans, a right use of the Koran. Appropriate verses may either be recited, or embodied in a *táwíz,* or amulet, and worn. But in a case of smallpox an ignorant Musalman will rather call a Hindu woman to sing heathen songs to it, because the goddess of smallpox is a Hindu divinity. A person possessed by an evil spirit is exorcised by reciting verses of the Koran, or by getting a *Miánwál* (disciple of the Kalhoras) to play on a stringed instrument, as David did before Saul under similar circumstances. Many devices are resorted to for averting the evil eye. African mothers leave their children unwashed with this object and Sindhi mothers even disfigure their little cheeks with black stuff. All classes believe in the influence of deceased *pírs* and a mother who has lost previous children will take her infant to the tomb of some saint and, shaving it there, leave its hair as an offering. A tree near the tomb at "Mugger Pir" is hung thick with little bags of hair.

CHAPTER V.

AGRICULTURE.

TABLES VII & VIII.

Arable Land. The total area of the Province amounts to 299,19,289 acres, of which 149,58,235 acres, or almost exactly one half, comprising forests, hilly and sterile tracts, lands occupied by buildings &c., were classed in 1904-05 as Not Available for Cultivation. The remaining 149,61,054 acres of cultivable land were distributed in the six Districts as follows :—Karáchi 19,60,347, being ·256 of its whole area ; Hyderábád 39,31,750, or ·77 of the whole ; Lárkána 23,61,076, or ·73 of the whole ; Sukkur 20,52,312, or ·59 of the whole ; the Upper Sind Frontier 12,42,337, or ·79 of the whole ; and Thar and Párkar 34,13,232, or ·38 of the whole. It is interesting to note that the Upper Sind Frontier, which, when John Jacob first took charge of it, consisted of dense jungle or sterile desert, overrun by plundering Baluchis, has now proportionately the largest area of fertility in the Province. Similarly in Thar and Párkar the extension of irrigation has added 3,87,731 to the acreage of cultivable land since 1900-01.

Of the 149,61,054 acres available for cultivation only 83,50,363 acres, or about 56 per cent, were taken up, and only 33,57,266, or 23 per cent, were actually under crops in 1904-05. Here again the Upper Sind Frontier leads the way with ·70 occupied and nearly ·34 under crops ; Lárkána follows with ·59 and ·27, then Hyderábád with ·57 and ·234, then Thar and Párkar with ·62 and ·221, then Sukkur with ·5 and ·18 ; and last, Karáchi, with only ·35 of occupied land and ·128 under crops. With respect to Thar and Párkar it must be remembered that nearly ⅔ of the District are excluded from the calculation altogether as incapable of cultivation. Another view of the conditions of agriculture in the Province shows that 28,02,962 of the total 33,57,266 acres in actual cultivation were under canal irrigation and 2,53,457 were irrigated directly from the river. In three of the Districts

this comprised practically the whole, for the well irrigation is comparatively insignificant; but in Karáchi and Lárkána there were 6,891 and 10,332 acres dependent on rain and mountain streams, while in Thar and Párkar 2,53,352 acres, or just one-third of the whole, depended entirely on rain. The progress of agriculture during the last 15 years is shown by the following figures:— **Arable Land.**

	1890-91.	1900-01.	1904-05.
Acreage occupied ...	66,18,806	80,01,941	83,50,363.
Acreage under crops ...	30,83,175	37,29,436	33,57,266.

Figures for each District in much fuller detail will be found in Table VII in the B. Volumes concerned, with some further notes.

Soils.

Excepting on and at the foot of the hills, and in the desert of Thar and Párkar, all the soil of Sind is alluvial, consisting of sand and clay in a very fine state of pulverisation. Eight samples collected in Sukkur, Lárkána, Kotri and Pithoro and examined by the Agricultural Chemist to the Government of India, were found to contain only ·75 per cent of material coarser than one tenth of a millimetre in diameter, while 34 per cent of it was under ·005 of a millimetre. The proportions of sand and clay differ in the soil of different situations, affecting its consistency and porosity, and the percentage of organic matter found present also varies; which differences are indicated by many vernacular names loosely used and often local. The following is an attempt at a rough classification of the principal varieties of soil so distinguished.

1. *Wáriási, i. e.* loose sand deemed fit only for melon cultivation. Analysis of a sample from Kotri gave the following result:—

Insoluble silicates and sand	76·74
Ferric oxide	3·16
Alumina	4·84
Lime	6·49
Magnesia	1·97
Potash	·57
Soda	·49
Phosphoric acid	·15
Carbonic acid	4·81
Organic matter and combined water...	·78
	100·00

Soils.

Organic nitrogen was present in very small quantity, not determined, while of available phosphoric acid there was only ·0008 and of available potash only ·006. But almost any crop will grow in *Wáriási* if it is sufficiently manured and watered: ground-nuts, *til* and garden roots do particularly well. A large part of the cultivable area in Umarkot and other parts of the Thar and Párkar District is classed as *Wáriási.* It is also called *Daman* in Sukkur.

2. *Kacho, i. e.* the soil resulting from recent inundation. It is called *Rio Kacho* if used for *rabi* cultivation the same year and *Pako Kacho* if it has had a season or two to dry and harden. *Latiári, Latwári* and *Lasiári* are local names for varieties of this and *Mithi* (sweet soil) is a general term applicable to it. *Gasiári* appears to indicate a larger proportion of sand. This soil is considered fit for almost all crops. An average analysis of four samples from different places gave the following result, from which it appears that *Kacho* is a good loam, rich in potash, but poor in phosphates and nitrogen:—

Insoluble silicates and sand	67·64
Ferric oxide	5·88
Alumina	7·78
Lime	5·69
Magnesia	2·28
Potash	1·01
Soda	·09
Phosphoric acid	·06
Sulphuric acid	·07
Carbonic acid	4·69
Organic matter and combined water...	4·81
	100·00
Nitrogen	·078
Available phosphoric acid	·0007
„ potash	·012

The principal difference between this and *Wáriási* lies in the larger proportion of alumina and iron, replacing sand. The former makes the soil clayey and more retentive of water.

3. *Chíki* or *Paki,* hard, baked soil, which has been submerged for a long time, also called *Khahuri, Ták, Rappa, Rip* and *Dhuban.*

When rough and cloddy it is called *Khariro* and *Khariári*. It is very cohesive and heavy to work and therefore is not liked, but rice, wheat, *jámbo* and other crops do well in it. The average result of an analysis of four samples is given :— Soils.

Insoluble silicates and sand	66·68
Ferric oxide	6·18
Alumina	7·76
Lime	6·50
Magnesia	2·69
Potash	1·14
Soda	·19
Phosphoric acid	·06
Sulphuric acid	·16
Carbonic acid	4·55
Organic matter and combined water ...	4·09
	100·00
Nitrogen	·075
Available phosphoric acid	·001
„ potash	·014

This contains the same proportion of alumina as *Kacho*, but even more potash and also more iron and lime.

4. *Ráo, Ráe-wári, i.e.* soil enriched by the detritus of hill torrents. It is naturally very various, differing in consistency as the basis of it is sandy or loamy. A light and very dusty soil, found about Hyderábád and called *Dasar*, should apparently be classed with this; but the terms *Dasar* and *Gasar* are widely used for soft and light-coloured but productive soils. Soils of this class are of course available chiefly for *baráni* cultivation. On analysis of two samples from Kandhkot and Sehwán they were found to differ from classes 2 and 3 chiefly in that they contained more limestone. Among their constitutents were :—

	Kandhkot.	Sehwán.
Total organic nitrogen... ...	·042	·021
Available phosphoric acid ...	·00025	·006
„ potash	·009	·011
Carbonate of lime	18·61	9·32

5. Lastly there is *Kalar*, that is, land more or less spoiled for agricultural purposes by excess of salts. This has some distin-

Soils.

guishing names. *Shor* and *Thát Kalar* are quite unfit for cultivation, while *Mitho Kalar* is capable of producing rice at least. A specimen of *Shor* from near the coast was found to contain 19·62 per cent of sodium chloride, 2·32 of calcium chloride and 1·04 of magnesium chloride. A sample described as *Thát* from Sukkur contained sodium chloride 4·18, sodium sulphate 39·10, magnesium sulphate ·91. These can scarcely be called soils at all: they are saline deposits. A sample of *Mitho Kalar* from Játi contained sodium chloride 3·48, magnesium chloride ·84, calcium chloride 1·42. A good, clayey soil may have as much as 6 or 7 of sodium chloride and yet be fit for rice and after it leguminous crops and oil seeds. This is of course because the process of rice cultivation, during which water stands continuously in the fields and is frequently changed, washes out most of the salt. Such soil is known as *Dangiási* or *Dangáchhi*. *Kalráthi* is another name for soil in which *Kalar* is mixed with good earth. In these soils the salts are generally near the surface and can be washed out, so that regular irrigation, with drainage, may convert tracts which seemed to be hopelessly barren into fertile fields. More than 50 years ago Major Jacob reported that, after the Begari canal had been deepened and widened, the hard and fast margin of the desert was no longer to be traced, because arable fields and rich meadows had been everywhere encroaching on inhospitable sand.

In the desert parts of Thar and Párkar all the soil is sand (called *Dágo*), but nevertheless yields small crops of *bájri* after rain. Cultivation in that country is, however, generally confined to particular situations, such as flat valleys and shallow, temporary tanks, where there must be a good deal of organic matter from decayed aquatic vegetation. On the margin of the Rann also there is hard soil, called *Káthi zamin*, which is submerged in summer and yields *rabi* crops (wheat) after it dries. In Nangar Párkar the best soil is called *Dasar*. It has not been analysed, but probably belongs to the fourth of the classes above enumerated. As the hills are granitic, however, it probably contains little or no lime.

Seasons.

There are two main cultivating seasons, *kharif* and *rabi*. The former extends normally from June to October and coincides for the first three months with the height of the inundation. The

month for sowing is usually June, though occasionally seed and especially rice seed is put in in May, and if the rise of the river to a high and steady level happen to be late, sowing not infrequently takes place in July. *Kharif* crops are usually harvested in October. According to a popular formula *Juári* requires 3 *chálihás* (periods of 40 days) or 4 months to reach maturity and *bájri* 3 *tihás* (periods of 30 days) or 3 months; cotton on the other hand does not yield the final picking under 5 *chálihás* or nearly 7 months. The *rabi* season ordinarily comprises the period from October to March, though sowing may occur from September till early December and reaping may go on into April. A third season termed *ádháwa* in Hyderábád and *peshras* in Upper Sind, lasting from April to June, is recognized, but owing to the want of water at that period of the year the area sown is exceedingly small and only subsidiary crops, such as *juári* for fodder, pulses and vegetables and in Upper Sind tobacco, are grown. **Seasons.**

The names of the months in the Sindhi calendar, with their English equivalents, are:—

Chet	... March—April
Vesákh	... April—May
Jeth	... May—June
Akhár...	... June—July
Sáwan	... July—August
Bado	... August—September
Asu	... September—October
Kati	... October—November
Náhri...	... November—December
Poh	... December—January
Mángh	... January—February
Phagun	... February—March.

In the desert and on the hills, though the seasons are the same, the farmer's operations, depending entirely on rain, vary with its variableness. *Kharif* sowing can rarely begin till well on in July and there is little or no *rabi*.

Principal Crops.

Table VII in the B Volumes shows the area under each kind of crop, in each district, in the years 1880-81, 1890-91, 1900-01 and **Principal Crops.**

Principal Crops.

1904-05. It will be sufficient here to make some notes of a general kind applicable to the Province as a whole.

CEREALS.

Rice is by far the most important crop cultivated in Sind, nearly a million acres having been under it in 1904-05. It is almost the only thing that can be grown in the annually inundated lands within the Delta of the Indus, but a larger quantity and much finer quality is produced in the Lárkána District, in lands watered by the *nais*, or mountain streams, as well as those traversed by canals. In Hyderábád also and Thar Párkar a great deal of rice is grown: Sukkur and the Upper Sind Frontier produce least. After rice comes *bajri** in order of importance. This grain and *juári* constitute the principal food of the working classes, but *bájri* is more wholesome and is much more extensively cultivated, especially in the Hyderábád District and Thar and Párkar. In Lárkána, Sukkur and the Upper Sind Frontier there is more *juári*. Wheat comes after *bájri*, the area under it being nearly equal. It is grown chiefly in the Lárkána, Sukkur and Thar and Párkar Districts. Barley, maize and a few other cereals are grown in insignificant quantities.

PULSES.

Pulses succeed cereals in importance and of the land under these two-thirds are devoted to *Matar*, called Chickling Vetch in the returns. It is grown chiefly in Lárkána, but also in Sukkur and the Upper Sind Frontier. Gram, which is grown more in the Upper Sind Frontier than anywhere else, is the only other pulse of much consequence.

OILSEEDS.

Passing over indigo, tobacco and other miscellaneous crops, none of which are cultivated on such a scale as to deserve notice, oilseeds and cotton remain. The area under oilseeds of all sorts in 1904-05 was less than 300,000 acres, being about $\frac{1}{9}$ of the area under cereals. *Jámbo*, which is consumed in the Province, being the source of the vegetable oil in most general use, and also exported under the same name as rape, nearly equals all the others in the area devoted to it. Sesame and rape, which are exported, are the only others worth mentioning. Oilseeds are grown chiefly in the Hyderábad, Lárkána and Upper Sind Frontier Districts, sesame being the favourite in the last named.

COTTON.

The cultivation of cotton has scarcely advanced in

* To avoid repetition, the reader is referred to the paper on Botany in Chapter II for the botanical and vernacular names of all the crops mentioned here and other useful information concerning them.

Principal Crops.

the last 25 years except in Thar and Párkar, where there has been a remarkable development quite recently. Hyderábád is the only other District in which it is grown to any considerable extent. In 1904-05, 217,602 acres of land were under cotton cultivation in all Sind and the yield, about 100,000 bales, was large; but the quality is said to be about the worst produced in India. It only commands a price because it is found useful on the continent for mixing with wool or making imitation woollens. Attempts to introduce better varieties, of longer staple, have met with little success because they take longer to come to maturity, and since they cannot be sown until the inundation sets in, about May or June, the winter frosts nip them before the crop is ready for gathering. The extension of perennial irrigation is, however, removing this difficulty and very promising experiments have been made during the last two years with Egyptian cotton. In 1904, Mr. M. D. Mackenzie, Deputy Commissioner of Thar and Párkar, made experiments on three selected plots of land at Mirpur Khás and Pithoro, the results of which were so encouraging, with respect to both the quality and quantity of the crop, that in the following year 1,500 acres of land were sown with 10 tons of seed distributed among intelligent Zamindars. The yield in some cases was remarkably heavy, being far in excess of what can be obtained from indigenous cotton, and the quality so good that samples sent to Liverpool realised 10d. a lb., against 4d. a lb. obtainable for Sind Cotton. It is intended to put 5,000 acres under Egyptian cotton during the current year. (1906).

GENERAL PRODUCE.

Less than 40,000 acres in the whole Province were devoted to the cultivation of Fruits and Vegetables. Green vegetables occupied more than 16,000 acres and roots and tubers 8,349, the remainder comprising fruit and flower gardens. The various vegetables and fruits in common use are enumerated and described under Botany in Chapter II.

METHODS OF CULTIVATION—KHARIF CROPS.

Methods of Cultivation, Kharif Crops.

RICE.

Rice is either sown in a prepared seed-bed and transplanted, or else the seed is sown broadcast in the field in which it is to grow. The latter method (called *korar sáriyún*) is resorted to from indolence, or in low lying lands, such as beds of *dhands* and natural depressions, which retain moisture for a long time and are not suitable for transplantation. As soon as such land is dry

Methods of Cultivation, Kharif Crops.

enough, it is ploughed several times and rolled; then the seed is put in broadcast about April and the land ploughed again. Water is not usually admitted until the plants have grown a few inches. Sometimes the seed is put in with a drill, and sometimes the land is flooded and the seed is thrown on the water. From 1 to 1½ maunds of seed are required per acre for this kind of cultivation. Transplantation, though more troublesome, gives far better results and is usual both in Upper and Lower Sind wherever the nature of the land admits of it. The seed-bed is either a moist corner of the field, which is ploughed several times, rolled and sown and only slightly watered as the plants grow, in which case the method is called *bejo*, or *puråniyún bejáriyún*, because the seedlings are grown on the old moisture; or else it is a small prepared plot on which manure has been burned. The seed is sown among the ashes and well and frequently watered. This method is called *khámosh* or *lurhia*. When rice is intended for transplantation the quantity required appears to be less on the average than one maund per acre of the field in which it is to be reaped, and the out-turn is much larger than when it is not transplanted. The average result of 19 experiments made in all parts of Sind was 1,638 lbs. per acre, but it may be questioned whether this is of much practical value. The highest results (over 2,000 lbs.) were obtained in the Mehar, Ghotki, Sánghar and Játi Talukas. The average value of the crops per acre was Rs. 33-10-0, the highest being Rs. 57-7-4 and the lowest Rs. 12-7-2.

Transplantation *(vehráj)* is done entirely by hand, a month or more after sowing, when the seedlings are about a foot high. They are ready much sooner under the *khámosh* than the *bejo* treatment. The land, having been ploughed more than once during the winter, is again ploughed and flooded as soon as the canals fill, and the roots of the seedlings, in small bunches, are thrust into holes made in the mud with the hand or a stick. After that the field is kept flooded, the water being renewed occasionally, especially if any *kalar* land drains into the field. Rice is ready for the sickle in from two to three months after transplantation, and all the male and female labourers gather to the reaping. They commonly receive payment in kind, from $\frac{1}{10}$ to $\frac{1}{15}$ of the quantity which each one reaps. The plants are cut a few inches above ground. To separate the grain from the straw, the whole is spread on a threshing floor *(kharo)* hardened and smoothed

with *kalar* earth and trodden by cattle. The grain thus obtained is commercially known as "paddy" (Sindhi, *sáriyún*). To make "rice" (*chánvar*) of it, it must be husked by being passed through a *jandri*, *i. e.* a hand-mill made of clay instead of stone, after which it is pounded with wooden pestles in earthenware mortars to remove the fine skin under the husk. Rice straw is good fodder for cattle, but horses do not like it.

Methods of Cultivation, Kharif Crops.

A peculiar method of cultivation obtains in the *bhal* lands of the Ghorabári and Sháhbandar Talukas, which are within the reach of tidal influence and liable to submergence by water more or less salt. These lands are never ploughed, except by the feet of the buffaloes which are turned in after the harvest to feed on the stubble and weeds. They knead the mud most effectively. When, with the rise of the Indus, fresh water predominates over the salt, it is admitted into the fields, which are enclosed with high *bands*, and allowed to stand in them until the seed is ready to put in. The seed undergoes a curious preparation. It is first packed in bags made of rushes and laid to soak for four days in pits filled with sweet water, then spread on a platform of hardened clay, covered with mats and earth and left for four days more. At the end of that time, having begun to germinate, it is washed, laid on mats and watered well for two days more. It is then ready for sowing, which is accomplished by throwing it in handfuls into the air and allowing it to alight, with the radicles lowermost, on the soft mud of the field, from which the water has previously been drained away. For the next three days, until the seeds are established and able to bear submergence, they are a sore temptation to birds and must be watched day and night. Heavy crops are obtained with little labour by this method of cultivation, but only red rice thrives on it. There are many varieties of rice, known by as many names. *Sugdási* is one of the best known, a fine, white rice : *sathria* and *sonáhri* are other white kinds. *Motia*, *ganja*, *kámbru* and *lári* are red.

BAJRI.

The *Bájri* plant is hardy and less exposed to the attacks of insect and fungoid pests than *juári*. As soon as water enters the canals, generally in the early part of June, the Persian wheels, which have been previously placed in position, are set at work to irrigate the land preparatory to ploughing. Sometimes two

Methods of Cultivation, Kharif Crops.

floodings are given before further operations are undertaken. When the surface moisture has been partially absorbed, seed is scattered and the land ploughed again ; but sometimes, if the ground is hard, or plough cattle are not available, this ploughing is omitted. The seed rate ranges from 6 to 16 lbs. per acre. The field is then divided into compartments (*bára*) by low earthen ridges (*bana*) for convenience of irrigation. If asked at this stage how his cultivation progresses the agriculturist will respond that his field holds *bana*. Another watering is given ten days or a fortnight later and after that the waterings succeed each other at intervals of a week or ten days : sandy soils require water more frequently. The spike in its sheath appears in about 40 days : this stage is known as *dido chaunk*. A fortnight later the grain begins to form in the spike and the necessity for its protection from the depredations of birds immediately arises. For this purpose a platform (*peho)* supported on poles is constructed, from which the watcher can view the tops of the waving corn. Standing there armed with a sling (*khambháni*) and provided with a pile of clay pellets (*gulela*), which he hurls with an accompaniment of imprecations at his feathered foes, the cultivator, or one of his sons, guards the crop from morn till eve. The cultivation is now said to have reached the stage of containing *pehas*. As the crop ripens the watcher remains at his post, though perhaps asleep, through the night to ward off other dangers. *Bájri* is ready for the sickle in three months. The spikes are cut off by the reapers, men and women hired for the occasion, and stacked at a previously prepared threshing floor (*kharo*), of which the surface is made of saline earth or otherwise hardened as much as possible. The reapers (*láhyára)* are commonly paid in kind, each receiving at the end of the day a quantity of spikes containing about 2 *toyás* or 16 lbs. of grain. The spikes are cut off quite short, the stalks being reaped afterwards. When all the spikes have been collected they are spread out to an even depth around a pole (*muni*) fixed in the ground and the grain trodden out by cattle. The outturn of grain averages about 900 lbs. or a little less than half a *kharár* per acre, and of straw about 4,500 lbs. The results of crop experiments made in the five years ending 1901-02 range from 480 lbs. of grain per acre in the Karáchi District (hill cultivation) to 1095 lbs. in the Hyderábád.

The method of cultivation above described prevails in the Hyderábád District and, with little modification, throughout Sind in irrigated lands. In the desert portion of Thar and Párkar, and wherever cultivation depends on rain, the farmer has to adapt himself to quite different conditions. He cannot begin till rain falls, which may be in June, or in July, or not till it is too late to be of any use. Dams are usually put up across valleys, or hollows, to confine the precious water. Immediately after the ground has been sufficiently moistened it is ploughed and then rolled with the *Sánhar* to prevent the moisture evaporating. A few days later it is again ploughed and the seed sparingly distributed with a drill: three *sers* suffice for an acre. After that the progress of the crop depends on more rain. The time of reaping should be October, but varies with the time of sowing. The outturn is small compared with that of irrigated lands.

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JUARI.

The cultivation of *juári* is similar in all respects to that of *bájri* save that the crop matures in four instead of three months and consequently requires water for a longer time. Manure is not usually employed unless the land is cultivated without fallows. The seed, which is soaked overnight in water, is scattered by hand, the usual rate being from 1 to 2½ *toyás*, from 8 to 20 lbs., per acre. Subordinate crops, such as *sáon*, *guár* or field vetch (*Cyamopsis psoralioides*), green gram and *chaunra*, are frequently sown with *juári*, either mixed with it or along the edges ef the compartments. In some parts, *e. g.* the south of the Karáchi District, *juári* and *bájri* are grown together. Seedlings are transplanted from patches of the field where they are thick to patches in which the seed has not germinated well, and it is the popular belief that transplanted *juári* sends its roots deeper and yields more than that which has not been moved. *Juári* grows to a height of ten or twelve feet and the heads therefore have to be cut off after the reaping: the grain is threshed in the same way as *bájri*. *Juári* straw, called *karbi*, is excellent as fodder for cattle and horses and is sheaved and stacked in ricks (*dan*). The stalk (*gano)* is sweet and is eaten to a small extent by the cultivators, like sugarcane. The crop grown in the *ádháwa* season, or hot weather months between the regular *rabi* and *kharif* crops, which is called *árhari juári*, is simply cultivated as a fodder. Five years' experiments with *juári* show a yield

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ranging from 1308 lbs. per acre in Shikárpur to 2265 lbs. in Karáchi.

Juári is not much cultivated on rain showers alone, but it is on land irrigated from hill torrents *(Nais)*. In this case the process is in some measure similar to the *bárani* cultivation of *bájri*; but if rain falls near harvest time *juári* sprouts again from the roots after being cut and a second crop is obtained in March or April. If rain falls again in May another *kharif* crop may be obtained from the same roots.

MAIZE.

Maize is grown chiefly as a subordinate crop in the *kharif* and as a fodder crop in the *ádháwa* season. The *kharif* sowing takes place in June or July: the seed is mixed with cotton, *juári*, or *bájri*. The crop ripens in September, but the cobs are cut while the grain is still soft in them if intended for use as a vegetable.

SAON.

Sáon is a cheap millet which is grown in the same field with *bájri* and *juári*. It ripens quickly. The grain is eaten by Hindus on fast days and to a small extent by poor cultivators. It is also grown as a fodder.

CHAUNRA.

Chaunra is a pulse which is grown as a subordinate crop along with *bájri*, *juári* or cotton, either mixed with these or in one or two separate compartments of the same field. The pods are picked in September and October.

SESAME.

The method of cultivation of sesame is the same as that employed for *bájri* and *juári*, with which in fact sesame is generally sown, either in separate compartments of the same field or along the ridges of the field channels. White and red varieties are grown: the former commands a better price. The seed rate is generally from 4 to 6 lbs. per acre and the outturn from 400 to 500 lbs. if the evidence of crop experiments may be accepted. The crop matures in three months and is reaped with a sickle, the stalk being cut near the roots. When dry the capsules open and the seed is shaken out by hand.

COTTON.

Cotton is cultivated in several ways. The following is prevalent in the Hyderábád District. If the land is not well fallowed a dressing of 6 tons of manure per acre, costing Rs. 12, may be given. Soil from old buildings is also used when available: in the neighbourhood of Brahmanabad the *debris* of that ruined city

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is freely employed. The seed, which is soaked in water and cleared of lint by rubbing it in the dust, is sown by hand, the usual allowance being 24 lbs. per acre if seed obtained from hand-gins is used and twice that quantity if the seed is procured from a ginning factory. In some places the seed is drilled. Sowing takes place in June after the land has been thoroughly ploughed and moistened. The land is ploughed once more after the seed has been put in. The crop requires no water for a fortnight, after which it is watered at intervals of 8 or 9 days. It requires to be weeded twice or thrice at intervals of a month. The first picking is ready in November, after which three or more pickings are taken until February. The pickers get from one-sixteenth to one-twentieth of the quantity they collect. An ordinary yield is about 1,100 lbs. per acre of seed cotton, worth from Rs. 40 to Rs. 50. In the virgin soil of Digri in the Hyderábád District the yield has been as much as 1,600 lbs. per acre, worth from Rs. 55 to Rs. 70. The published returns show an average of about 300 lbs. per acre of cleaned cotton, but they are very scanty. If severe cold sets in before the cotton is picked, there is serious risk of its being frostbitten, on which account a very inferior variety, but one which matures rapidly, has been the favourite in Sind.

But cotton is also raised by well irrigation and in that case the seed is sown in February. The land, which should be soft and silty, is first watered, then ploughed once or twice and rolled with the *sanhar* between September and November. It is once again ploughed before sowing and then furrowed, and the seed is put into the ridges by hand. Pickings commence in July. This first crop is called *neri*. A second (*mundhiyún*) is obtained in the following year by leaving the plants and cutting them down in February. They grow again from the old roots.

A third, very primitive method (called *belái*) is followed on soft, or even sandy, soils near the river, which have been flooded and remain moist. The ground is merely ploughed once and rolled, and then the seeds are put in at intervals with the fingers. The plants grow very tall and strong, but the cotton is coarse. The introduction of Egyptian cottons, mentioned elsewhere, will no doubt, if successful, bring in more careful processes than any of these described.

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SUGARCANE.

Sugarcane is best laid down in February, as it ripens then, if well manured, in November and thus escapes the destructive frosts which not infrequently occur about the end of December and later. But it is occasionaly laid down as late as May and in that case is not ready before February. The first crop, grown from fresh sets, is known as *neri*: if the plants have been strong a ratoon crop, called *bánth*, is grown from the old roots after the first crop has been cut. The ratoon crop matures in less time than the first. Land intended for the reception of sugarcane is given a dressing of from 10 to 30 tons of cattle dung per acre, costing about Rs. 1-8-0 per ton. It is thoroughly ploughed and divided into small compartments, in which the sets, numbering from 20 to 30 thousand per acre, are planted upright. The sets (*bulli*) consist of short lengths of cane, each containing a joint, from which two or three sprouts will grow. Before the final planting they are kept in soft mud till the sprouts appear. A good flooding is then given to the land, after which the crop is watered once a week. The irrigation is generally by lift, one wheel being capable of irrigating 5 or 6 acres. The crop is weeded once a month for the first four months. Sugarcane makes slow growth during the first three months and it is common to grow with it subordinate crops such as small-fruited dolichos (*chaunra*) or *bájri* for fodder, which are removed before they interfere with the principal crop. The cane is cut with a sickle and crushed in presses worked by camels or oxen. The old wooden press (*chíchro*) is being rapidly supplanted by iron machines. The extracted juice, to which a little *chániho*, or crude carbonate of soda, is added to facilitate the removal of the scum, is boiled down in large iron pans to the state of a soft solid, in which it is sold as *gur*, misnamed "molasses." It is simply unrefined sugar. An average crop yields over 4,000 lbs. of this per acre, worth Rs. 250 to 300, according to crop experiment returns. A considerable quantity of cane is sold intact to be eaten fresh.

INDIGO.

A light soil with a deposit of fresh silt is considered the best for this crop. As soon as the canals fill in June the field is irrigated and well ploughed and then divided into small compartments, in which the seed is scattered whilst the earth is still quite wet. From two to three *kásás* (76 to 114 lbs.) of seed are put in per acre. The seed is soaked overnight in water. The field is

given a slight watering every second day until the plant shows about two inches above the ground, after which water is given every fourth day: after the crop is about 18 inches high water is only given once a week. The crop is weeded when it is about 3 inches high and again when it has reached a height of 18 inches. Indigo plants are ready for the sickle in about 3 months. A crop grown from seed is called *neri*. The roots are invariably allowed to remain in the ground for a second crop called *mundhiyun* in the following year: this ripens in 2½ months and is the crop from which the seed is always taken. The seed fetches about 13 annas a *kásá*. A yield of 40 lbs. of dye per acre is considered fair, the value being about one rupee per pound. The dye is extracted from the stems and leaves of the plant, which are soaked in water in pits (*hauz*) constructed of bricks and mortar. The reaping is always done in the morning and the produce thrown into the pits at midday. After immersion for 12 hours the stems and leaves are removed and the water is churned for 2 or 3 hours. The contents are then allowed to settle for 6 hours, during which the dye is precipitated at the bottom of the pit.

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BOMBAY HEMP.

This is grown in small patches for the convenience of the cultivators. The landholder has no share in it. The seed is sown in July in a small compartment of a *juári* or *bájri* field, or along the ridges of the compartments. The crop is watered along with, and is reaped soon after, the principal crop. After it has been reaped the seed-pods are cut off and the stalks are soaked in water for 4 or 5 days, when they are taken out and dried and the fibres (*tanduro* or *sut*) stripped off by hand. From the fibres the cultivators make ropes, for which they find numerous uses in agriculture.

TOBACCO.

Tobacco is always raised from transplanted seedlings. In the Hyderábád, Karáchi and Thar and Párkar Districts the seed is sown in June, on ridges, in a seed-bed which has been thoroughly ploughed, irrigated and manured. The seed rate is from 4 to 8 lbs. per acre. After a month's growth, the seedlings are removed and planted out singly, on ridges, in a field well manured with the droppings of sheep and goats. If possible the grower gets these animals penned in his field for some time, but if he cannot arrange this he gives the land a dressing of about 5 tons of manure per acre at a cost of Rs. 15. The crop

Methods of Cultivation, Kharif Crops.

is watered every day for the first three days, after which the waterings are gradually reduced to one a week. Reaping takes place about December and is done between dawn and sunrise. The whole plant is cut down at the root and on the following day the leaves are taken off and spread out in the sun. The drying takes a fortnight or more, during which the leaves are turned over every third or fourth day. When dry the leaves are collected in a heap, which is covered over with palm-leaf matting and weighted. After remaining in this condition for about a fortnight the leaves are sewn up in bags (*toris*) made of date fibre, each containing 160 lbs. and worth Rs. 10 or Rs. 12. The best Hala tobacco fetches sometimes as much as Rs. 20 per bag. In Hala an outturn of 1,400 lbs. per acre is considered fair; elsewere the average is from 100 to 200 lbs. lower. A test taken in Moro in 1902-03 revealed a yield of 1,497 lbs. of tobacco leaf per acre, worth Rs. 109. The land received a dressing of 500 loads of manure per acre. In the north of Sind tobacco is a spring (*ádháwa*) crop, the seed being sown between December and February and the leaves picked from April to June, but the method of cultivation does not differ materially.

Methods of Cultivation—Rabi Crops.

Methods of Cultivation, Rabi Crops.
WHEAT.

Land is prepared for wheat by being flooded at the end of the inundation, ploughed once or twice, pulverised and then rolled to restrain evaporation of moisture. Flooded lands, the beds of *dhands*, &c. are prepared in the same way as soon as the water dries off them. No further watering is required except in lands dependent on artificial irrigation. Manure is not generally used. Seed is scattered occasionally, but usually it is drilled. The seed rate varies enormously, the ordinary range being from 50 to 180 lbs. per acre. Sowing takes place in November and December and reaping generally in April. The reapers are either paid in cash or given from one-fifteenth to one-twentieth of the quantity each reaps. The yield deduced from crop experiments in the 5 years ending 1901-02 ranged from 1,242 lbs. per acre in Shikárpur to 750 in Thar and Párkar. The yield of straw may be about 2,000 lbs. per acre.

RAPE AND JAMBA.

Both crops are invariably grown either in *kacha* and other lands which have been submerged by the spill of the river or of a canal (*saiálbi*), or on lands which have been given a flooding

Methods of Cultivation, Rabi Crops.

by wheel irrigation towards the end of the inundation (*bosi*). Sowing takes place late in September or in the early part of October. The seed is generally scattered, but sometimes drilled, the usual rate being about 2 *toyás* or 15 lbs. per acre. The crop is frequently grazed a little in order that the plants may grow thick. The leaves of rape are also used as a vegetable by all classes. Reaping is done in March and April, the reapers being paid 4 annas a day or one-fifteenth of the produce. An outturn of 20 *kásás* or 600 lbs. per acre, worth about Rs. 20, is considered normal. Recent experiments give results ranging from 426 lbs. in Thar and Párkar to 933 in Hyderábád. The grain is threshed out by bullocks.

GRAM.

The cultivation of gram is in all respects similar to that of rape and *jámba*, except that it ripens a little later. In reaping the whole plant is plucked up. The seed rate is something less than a maund per acre.

CHICKLING VETCH.

The cultivation of chickling vetch is simple, like that of gram, or *jámba*. In *kacha* lands the soil is frequently not even ploughed, the seed being scattered over the cracked surface; and no further irrigation is given, nor any manure. The seed rate is about 2 *kásás* or 75 lbs. per acre. The crop is frequently grazed in order to strengthen it and the leaves are used as a vegetable by the cultivating classes. The crop ripens in March, when the plants are pulled up by the roots and the pods trodden out by cattle. An average yield of pulse is 24 *kásás* or 900 lbs. per acre, worth Rs. 16.

Vegetables.

Vegetables.

A list of the principal vegetables cultivated in Sind will be found in the article on Botany. The methods of cultivation cannot be given in detail. All the roots are grown in the winter. Of the greens, hibiscus (*bhendi*), brinjals, purslain and amaranth are sown in the commencement of the *kharif* season, whilst the rest are sown in November and December. The gourds are nearly all grown in the *kharif*: the only kinds which are sown in the *rabi* are melons, musk melons and water melons. In addition to these the pods of the *guár* (*Cyamopsis psoralioides*), a pulse occassionally sown with *bájri* and *juári*, and of the horse-radish tree (*Moringa concanensis*) and the young leaves of rape and gram are used by all classes as vegetables. In the winter tomatoes,

Vegetables.

lettuce, beetroot, cauliflowers, peas and other European vegetables are grown for the consumption of Europeans in gardens near to large towns.

Spices.

Spices.

The principal spices cultivated in Sind are red chillies (*garha mirch*), coriander (*dhána*), fennel (*saunf*) and mustard (*ahur*). Chillies are grown both in the *kharif* and *rabi* seasons, the rest only in the *rabi*.

Fruits.

Fruits.

It is a curious fact that, vegetarian as he is, the native of India is not a fruit eater. As a boy he exhibits the same craving for unripe berries and wild fruits as boys in other parts of the world, but when he grows up he does not cultivate fruit for his own consumption. The apple tree and currant bushes of an English cottage have no equivalent in this country. It is only in the vicinity of large towns and markets, or about the mansions of the wealthy, that orchards are to be seen. Describing Tatta in 1699 Captain Alexander Hamilton writes, "The King's gardens were in pretty condition and were well stored with excellent fruits and flowers, particularly the most delicious pomegranates that ever I tasted." It was Tatta then ; now it is Hyderábád, where, if there is no king, there is a population able to appreciate and pay for good fruit. Near Karáchi also, along the Lyári river and as far as Malír, there are gardens, owned by Khojas or Memans, which supply the market with all the standard fruits, of which the following are the principal.

MANGO.

This is very inferior even to the second rate varieties grown in Bombay and little is done to improve it. The tree is never grafted as all good mangoes are in Bombay. It is raised from seed, which is sown between July and August in a nursery, from which it is transplanted after two or three years. For about five years other things are cultivated round about it, so that the soil is frequently dug up and well manured with cattle manure, or goat's dung. After that it is not manured, but the roots are exposed for a few days in the autumn, after which the ground is well watered and turned up. A mango tree begins to bear fruit when 5 years old. The fruit begins to appear in March and ripens in June or July.

This is grown from cuttings, which are put down about March or August and begin to bear in two years. Figs are regularly manured with goat or cow dung and also pruned in February or March, when their roots are also exposed for a week or two. The fruit ripens in July or August, before which it is customary to sprinkle or wash the foliage from the dust which would smother it. **Fruits.** FIG.

Cuttings are put down in the spring or autumn. The trees have their roots exposed and are manured either in spring or about June. In the former case the fruit comes on in July or August, in the latter about November. POMEGRANATE

These are raised by layers in the spring or autumn and are ready to bear in 3 years. They are manured at the same seasons, with goat's dung if procurable, otherwise with cattle manure. They are not pruned, but their roots are exposed before manuring and the leaves are removed by hand in December or January. The fruit ripens in May and June. The Sind apple is a very small fruit of unpromising appearance, but develops a flavour when cooked. It does not grow on the coast. APPLE.

Peaches are raised from seed sown in the spring and afterwards transplanted. The treatment of the tree is similar to that of apples, except that the leaves are not artificially removed, as they fall of themselves in the winter. The fruit ripens in July, earlier than any are obtainable from Quetta, and hence is in demand though not of high quality. They do not grow on the coast. PEACH.

Guavas may be raised from seed or layers : the tree is ready to bear in 3 years. The soil is richly manured in spring with buffalo or cow dung, but the trees are not pruned or otherwise treated. The fruit ripens principally at the end of the monsoon season. GUAVA.

Vines are raised from large cuttings put down in the spring and begin to bear fruit in the third season. In February or March they are severely pruned and the roots are exposed, after which the ground is richly manured with dung of goats and cows, or blood and offal and the entrails of fish. The fruit ripens in June and July and is done before the Quetta grapes are ready to compete. The Karáchi season is a little earlier than that of Hyderábád. The grape most commonly and successfully GRAPE.

Fruits.

grown is the *Kismis,* or seedless sultana, but the large Kandahar grape also grows well and several fine foreign varieties have been introduced.

PLANTAIN.

This is the poor man's fruit and is an exception to the rule that orchards are only found near large towns. Dense groves of plantain trees may be seen near many remote villages. The fruit may be described as execrable. There is no reason why it should be so, for the best Bombay varieties flourish in the soil of Sind. Plantains are propagated by separating the shoots which spring up around the parent stem after it has fruited. No further trouble is taken with them. They must have abundant water and are therefore usually planted near an irrigation channel or well, but the soil is rarely manured. The transplanted shoots produce fruit in the second year and at any season.

PAPAI.

This yields a quicker return than any other orchard tree, the fruit being ready to pluck eight months after the seed is sown. But the trees are short lived. Seed is sown at any time except the cold season, and after a short time in the seed bed the young plants are transferred to well manured land. They require liberal watering.

ROTATION, FALLOWS AND MANURE.

Rotation, Fallows and Manure.

These three things are interdependent and may be taken together. Rotation of crops, as understood in Europe since the days of Virgil, is unknown in Sind. Fallows are too well known: of the land in occupation last year $\frac{5}{7}$ was lying fallow. As to manure, the way in which the Sindhi farmer gets on without it would astonish his fellow in any other part of India, to say nothing of western countries. The truth is that, in the absence of competition, ambition and every other stimulus which urges the husbandman to get the most he can out of his field, the Sindhi has for generations cherished the gentler ideal of allowing his field to divorce him as little from his hookah as might be compatible with keeping the latter filled. The Indus has fertilised his field once a year, and if that proved insufficient, he could leave it for a while and till another, for land was lying around him in abundance, as it still is. But to describe the system on which he leaves land fallow is impossible, for he has

Rotation, Fallows and Manure.

no system. Land watered by flow, in which a *kharíf* crop has been grown, is generally left fallow for a year ; but land watered by lift gets less silt, so he lets it lie for two years, or three, or sometimes four. Lands which are inundated all the summer will go on year after year yielding a winter crop ; but if after some years they get impoverished and begin to give a poor return, he will give them a rest. So also rice lands flooded by the inundation are rarely left fallow : if they are, then a crop of *jamba*, gram, or something else, is taken from them in the winter, which is a step, though an unintelligent one, towards rotation. Very good rice lands are made to yield a winter crop regularly without lying fallow in the summer, especially in the Lárkána District. Deliberate rotation is only practised in the case of cotton and sugarcane. Cotton will not thrive for two successive years on the same land ; accordingly a cotton field is either left fallow in the second year, or manured and devoted to some millet. In the case of sugarcane, which is an exhausting crop and must be heavily manured, rotation appears to be practised from motives of parsimony. Having put so much into the ground, the farmer is loth to leave it unproductive when he can, without further expense, get from it a crop of pulse or millet. Sometimes garden vegetables, which require much manure, are put into the ground from which it is intended to raise sugarcane in the following season.

As has been said, the Sindhi farmer seeks very little help from fertilising agents. The farmsteads, especially in the south, contain great accumulations of manure, the removal of which would benefit man and beast alike ; but the adjoining rice fields, though cropped year after year, are never manured. The mud-flats of the Indus, which are yearly cropped with wheat and oil-seeds, and lands newly brought under cultivation, or those bearing leguminous crops, are also made to yield their produce year after year without manure. And the land justifies the indolence of its occupant, giving him larger returns than the farmer of any other province can show. One reason for this is that the average holdings are so large that the most thriftless cultivator can satisfy his wants by tilling portions in rotation and refusing to be troubled with exhausted ground. But some crops must be manured even in Sind, especially sugarcane, tobacco and vegetables ; and it may be noted that the two last are

Rotation, Fallows and Manure.

raised chiefly by Lohánas, Memans, Boráhs and other castes than the Sindhi peasant. The manure in most general use is the dung of cattle, sheep and goats, the last being considered by far the best for garden produce generally and tobacco. Another fertiliser which is in great request is the earth from the mounds that mark the sites of old towns and villages. Whether this is valued for the lime in it, or supplies those nitrates in which the soil of Sind is so poor, has not been ascertained. Canal silt is also valued and *kalar* is employed occasionally for various crops, especially when the soil is thin and dry. Sewage and town refuse and even nightsoil are employed to a certain extent near all large towns for vegetables and special crops. In 1904-05 the Hyderábád Municipality sold 49,000 cubic feet of nightsoil and about 45,000 cubic feet of street refuse, the price being Rs. 209 and Rs. 101 respectively. Blood and offal are used for fruit trees, especially vines, and fish also; but, with this exception, the use of fish manure appears to be unknown. Everywhere else in western India it is imported if not locally made. Green foliage also, which is deemed the only proper manure for cocoanut trees on the Kanara coast, is thrown away as worthless in Sind. Bones are exported to fertilise the fields of Europe. The only use made of ashes is that cow-dung and chaff are burned on the seedbeds in which rice is first sown.

Crop Pests and Diseases.

Crop Pests and Diseases.

This is a very difficult subject, firstly because the so called diseases to which crops are subject have only recently been scientifically investigated in Europe and are still awaiting such investigation in India;* and secondly because the vernacular names by which we have to indicate them here are so confusedly employed that information obtained from the most intelligent sources available cannot be fitted with certainty to its proper subjects. Pests may be divided under the following main heads:—1. Fungoid growths, 2. Minute insects, such as aphides. 3. Larvæ of the higher orders of insects working in concealment. 4. Open-air raiders, such as locusts, birds and beasts. The natives denominate the first three classes "Diseases" because the

*Indian Insect Pests, by H. Maxwell-Lefroy, just published (1906) gives much useful information.

cause of the damage that they do is not obvious. The following are enumerated :—

Crop Pests and Diseases.

Rati. This term, when correctly applied, indicates a disease of wheat known in England as "Spring rust." It is a fungus which appears as minute spots on the leaves, first orange-coloured and afterwards blackish. It is favoured by cloudiness and damp, and the remedies tried in England are thorough drainage and mineral manures to fortify the plants. No remedy is applied in this country.

Káni, a fungus that attacks *juári* principally, consuming the ripening seeds in the ear and filling them with its black spores. It is attributed to unfavourable weather, but steeping the seedcorn in water before sowing is supposed by some to have an influence in averting it. This is quite sound, for the germs of the fungus are on the seed when sown and begin their career when it germinates. The treatment in England is to steep the seed in a 1 or ½ per cent solution of copper sulphate for 24 hours. But this deteriorates the germinating power and an interesting note in Vol. 1, Part 3, of the Agricultural Journal of India describes better results obtained by steeping for four hours in a mixture of 1 oz. of formaline in 2½ gallons of water.

Mahlo. On the Jamrao Canal this is said to be applied to smut in wheat, but in general it indicates a black aphis (probably several species) which attacks many kinds of cereals, oilseeds, cotton and fruit trees, weakening them seriously by sucking the sap. The favouring conditions are damp and cloudy weather and the only remedy used in this country is to hope for a change in the weather. English farmers resort to washing with infusions of tobacco, or petroleum, mixed with soft soap, and to dressings of fine lime and soot.

Uli is another aphis which attacks oilseeds (*jámba* &c.)

Khas. This term, which may be translated "blight," is used when the heads of *bájri*, or *juári*, are thin or empty owing to cold, a bad wind, or some occult cause. There are many bad winds with specific names, such as *Bug*, *Vail* &c.

Angári, is a weed which grows in exhausted and ill-watered *juári* fields and blights, or starves, the *juári.* Weeding, copious

Crop Pests and Diseases.

watering and sprinkling with salt are remedies sometimes tried. The field is cleared of the weed by growing *bájri* or sesame on it for a year or two.

Murih, Murahi, Bokhro and *Rohro* are names for some of the countless caterpillars which feed, each on its own favourite crop, and do more or less mischief. One which attracts more attention than the rest is *Kinyo,* which attacks the stalks of *juári* from below and may be identical with *Suro,* a very serious sugarcane pest. It is the larva of a moth (*Chilo simplex*), which lays its eggs on the leaves of the plant. The larva burrows into the very heart of the stalk and eventually kills the plant. As it becomes a pupa in its burrow, much might be done to check its multiplication by burning all affected plants as soon as they begin to wither. Nothing appears to be done.

Murahi is the white-ant (termite), or some insect confounded with it, which attacks various plants at their roots and is treated with earth over which a *pír* has repeated incantations.

Mákoriun and *Kiuliun,* black and red ants, are also charged with injuries of which they are certainly not guilty, though they may be in attendance on other injurious insects.

Cotton has three special pests besides the Cotton Aphis. One is the Red Cotton Bug, with a black diamond mark on its back, which pierces the boll with its long beak and sucks the seeds. It does damage both by destroying the seeds and staining the lint. To shake the bugs into a pot of hot water, or kerosine oil, is an easy and effectual remedy. The second pest is the Bollworm, or rather worms, for there are three species, the pink* (*Gelechia gossypiella*) and the two spotted (*Earias fabia,* and *insulana*). They are the caterpillars of moths which lay their eggs on the young bolls, and their food is the seed, but in getting at it they do incredible injury to the cotton. They have been a serious pest in the Punjab for some time, but have not attracted much attention in Sind, where they appear to have no special name other than *kinyo* or *gadar.* The introduction of foreign cottons will assuredly bring them to the front. No effectual remedy appears to have been found except hand-picking of affected bolls. The third special cotton pest is a "borer" or beetle (*Sphenoptera*

* The colour is that of the grub, not the moth.

Crop Pests and Diseases.

gossypii), which bores into the stem of the plant and kills it. Burning all withering plants checks the spread of it.

Of open enemies the locust (*Makar*) is unfortunately too well known. The Sind locust is *Acridium peregrinum*, the same which plagued the Egyptians in the days of Pharaoh. Its breeding grounds in this country are in the Desert, in the hills near Karáchi and possibly in many other regions, where the female lays her eggs in soft sand or earth during the hot season or monsoon. The young locusts are said to emerge in a fortnight or so, but this probably depends on rain. They attain their wings in 6 or 7 weeks, after which they take flight sometimes to very distant regions, especially when, under favourable conditions, they have multiplied abnormally. All methods of waging war against the winged hosts have proved futile, but enormous benefit might result from organised destruction of the "hoppers."

Makri and *Tid* are grasshoppers and crickets, which differ from locusts only in not being migratory. The damage that they do is therefore local, but may be serious.

Siáto, landcrabs, are said to do much damage to rice, which is possible.

Kukai, tortoises, are charged with the same offence. The species has not been determined, but several species of the herbivorous genera of Testudinidae are found in the Indus and of course spread over all the rice country during the inundation.

Kua, rats, are a more serious nuisance, for which no remedy is sought, though it should be easy, with a little energy, to dig up their burrows and exterminate them, or to poison them. The Indian Mole Rat (*Nesocia bengalensis*), is probably the species in every case, for it is spread throughout Sind and stores large quantities of grain in its burrows, which may easily be recognised by the mounds of earth that conceal the mouths of them. This rat is fond of water, swims like an otter and lives by preference in rice lands and the banks of *dhands*.

Among feathered plunderers *Wahio*, well-named the "Jowaree Bird" before official spelling was invented, and known to science as *Pastor roseus*, is the worst. Starlings are often associated with it. *Bori* is a species of bunting (*Emberiza melanocephala*, or *luteola*) which collects in vast and hungry flocks and is deaf

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(*bori*) to the maledictions of the frantic watchman. *Mithu*, the parrot, does some injury also. The remedy for all these is the boy (*níngar*) and the sling (*khambháni*). Among wild beasts *Gidar*, the jackal, is one of the worst. In spite of its carnivorous lineage it has a sweet tooth and a *penchant* for sugarcane and melons. The porcupine (*Serh*) ravages gardens and is said to be especially destructive to potatoes. Wild hogs and deer are capable of doing much harm where they are common.

FIELD TOOLS.

Field Tools.

The implements used in agriculture are of the most primitive description and cost the cultivator a total outlay in cash not exceeding Rs. 5. The wooden implements, for which the cultivator supplies the material, are fashioned for him without extra charge by the carpenter, the latter receiving his payment in kind at the harvest. Of iron instruments the ploughshare, sickle and *rambo* are supplied by the blacksmith in return for a small share of the produce, and the only tools which require to be paid for in cash are the hoe and axe.

WOODEN IMPLEMENTS

The plough (*har*), which is drawn by one pair of bullocks, or, as commonly in the Desert, by a camel, consists of three main parts made of *babul* wood. The body (*har*) is a stout board from 3 to 4 feet long and about 9 inches broad, which inclines, when the machine is at work, in a slanting direction backwards. The guiding lever (*muthio*) is inserted in the upper end and in the lower the shoe (*chuni*), a pointed shaft about 2 feet long which works almost horizontally; the share (*phár*) is the iron point of the shoe and is about 9 inches long. Sometimes an iron *ghobo* takes the place of both *chuni* and *phár*. The draught-pole *haria*, which is about 7 feet long, is inserted into the body of the plough a little above the shoe and at the other end carries the yoke (*pánjári*). The latter is generally made of *nim* or *geduri* wood. The plough penetrates from 6 to 9 inches and is never weighted. It makes no furrow of course.

The other wooden implements required by the cultivator are the roller (*letan*), clod-crusher (*sánhar*), leveller (*kín*), mallet (*watohar*), rake (*dándar*, *dándári* and *páhori*), pitchfork (*biáno*) and the seed-drill (*nári*). The *letan* is a heavy wooden roller about 6 feet long and is drawn by two pairs of oxen. The *sánhar*, or *tar*, is a rectangular log of wood about 4 or 5 feet long and only

requires one pair of oxen. The leveller consists of two planks, each about 3 feet long and 1 foot broad, which are secured together at an obtuse angle by iron bands : it is dragged by a pair of oxen and is used for collecting earth for embankments as well as levelling. The mallet is a small hand-instrument for breaking clods. Three species of rake are met with. The large rake, *dándar*, has six or more broad teeth, each about 6 inches long, and is worked by two men, one of whom holds the handle while the other drags the implement by a rope: it is employed in making the small ridges which separate the several compartments of a field. The *dándári* is a smaller instrument used for collecting manure and ears of corn. The *páhori* is a plain board with a handle, which is used for scraping up cattle dung. The seed-drill is a funnel made of wood or bamboo, which is tied to the body of the plough : it has the same length as the body, so that the bowl is close to the ploughman's hand while the tube reaches down to the furrow. The inner diameter of the tube is about 1¼ inch : the drill never has more than a single tube. **Field Tools.**

IRON IMPLEMENTS.

The iron implements of husbandry consist of the hoe (*kodár*), axe (*kuháro*), sickle (*dáto*) and a kind of trowel (*rambo*). The hoe is of the kind used everywhere in India, with an iron blade about 13 inches square, into which the handle (*gan*) is fitted at nearly a right angle. The cost is about Rs. 2. Three kinds of axes are employed. The heavy axe (*kuháro*) has a blade nearly 6 inches long and is fitted with a handle 2½ feet long. A lighter instrument (*kuhári*), used for lopping branches and cutting down bushes, has a blade from 3 to 4 inches long. Another kind of *kuhári*, used for cutting chaff (*kutir*) for cattle in hard work, has a heavy blade 10 inches long and is fitted with a handle about 9 inches long. The cutting edge is always of steel. The price of a *kuháro* is about Re. 1-4-0, of a *kuhári* used for cutting chaff about Re. 1 and of the lighter instrument about 8 annas. The sickle has a curved steel blade about a foot long, with a serrated edge, and costs about 8 annas. The *rambo* is a kind of trowel used for weeding and has a steel blade about 7 inches long and 3 inches wide at the point, with a short curved handle. It costs about 4 annas. If there is a resident blacksmith in the village, he supplies sickles and *rambos* to the cultivators without charge, in return for a share of the produce.

Field Tools.

These are ordinary implements of the farmer in central Sind, but there are of course many more. The *chanjur,* or pickaxe, is not unknown, though little required. The *wáholo* is an adze used for hacking out roots and stumps.

WATER WHEELS.

Of contrivances for raising water the *nár,* so common on the banks of the canals, is simply a Persian wheel with a small, strong, cogged wheel immoveably fastened to a prolongation of its axle and interlocking with the cogs of a horizontal wheel. A long pole from the latter connects it with the blind-folded bullock, or camel, which walks wearily round it and turns the whole arrangement. An approximately circular form is obtained for the wheels by making their circumferences of short lengths of wood connected by wooden rivets. The cogs are also of wood, rough hewn and securing the maximum of friction possible. The waste of animal power must be enormous. The leather bag (*kos,* or *boko*) for raising water from very deep wells is identical with the *Mot* of the Deccan and appears to be a Hindu invention. It differs from the Persian wheel in this that half of the water raised does not tumble back into the well. The huge bag, which has the form of a teapot, is let down by a strong rope working over a high pulley which projects far over the well. Another rope attached to the end of the teapot spout runs over a lower pulley at the margin. It follows that, as soon as the bag is raised above this level, the spout is pulled out horizontally and the water gushes into a place prepared for it.

CARTS.

The cart *(gádi)* of the country is too well known to need much description. General Jacob wrote of it, "They are rude and noisy ; at first sight they seem ridiculous ; but they can be constructed in any village at a cost of four or five rupees, while the loads they carry are as heavy as could well be drawn by a pair of bullocks." So he let them alone and they have remained, except in Karáchi and Hyderábád. Their wheels are solid discs, or nearly so, without tires. There is indeed no iron in their construction. They are made of rough-hewn pieces of wood mortised into each other, which, if they come out, can be hammered in again with a stone. In Sukkur and Shikárpur these carts are to be seen in their original innocence, and heard also. The unintermitted squealing of their wheels and its necessary connection with their progress encourage the idea that it was part of the

inventor's design. The cessation of it at once makes the nodding driver aware that his bullocks have stopped.

Field Tools.

Live Stock.

Live Stock.

Sind is still a pastoral country, though not at all to the same extent as it once was. The distribution of the kind of wealth to which the word 'pecuniary' owes its origin is shown in Table VIII in the B. Volumes. A few totals for the Province may be given here.—

Milch Cattle	6,95,704
Bulls for breeding	5,169
Plough Cattle	5,38,933
Sheep	2,61,924
Goats	8,28,210
Camels	92,333

Hyderábád has more milch cattle than any other District. The number works out to 230 per thousand of the human population, a surprising proportion explained only by the exports of *ghi*. The Upper Sind Frontier has a higher proportion, 231, and Sukkur and Lárkána follow with 228 and 227. Karachi has only 196, but the proportion of breeding bulls is much larger, indicating that it contains one of the principal cattle breeding tracts. Thar and Párkar furnishes the same index, having one breeding bull to every hundred milch kine.

In plough cattle the Sukkur, Lárkána and Hyderabad Districts show 56, 54 and 53 to the square mile of occupied land, but the Upper Sind Frontier, with a larger proportion of its area under actual cultivation than any of them, has only 30. The plough cattle in Thar and Párkar include camels. Hyderábád has most goats, but fewest sheep of all the Districts except Sukkur. The sheep are to be found on the hills and with the Baluchis. The Upper Sind Frontier has 15 per square mile and Lárkána 12. It is curious that goats should predominate in the flat country, but so it is. They thrive in scrub jungle and *babul* thickets, and the Hyderábád District supports 38 to the square mile. It is also the great camel centre for the same reason, having 6 per square mile. The average for the rest of Sind is about 1.

Live Stock.

CAMELS.

Elephants were kept by the native rulers of Sind from the earliest times and it appears that in the days of Mr. Pringle there were still three belonging to the British Government, but they were disposed of. One cannot suppose that they were of much use. The means of transport most natural to Sind is and always has been the ship of the desert and there is evidence that twelve centuries ago camel keeping and breeding was the occupation of a large section of the people, as it is at this day chiefly in the Hyderábád and the Thar and Párkar Districts, but also in those of Lárkána and Karáchi. Some attention is paid to selection and distinct breeds are recognised. As riding camels (*mahri uth*) none are considered superior to the *dháti,* or *tharri, i. e.,* those of the Desert, which resemble the Bikaner camels, the finest in India. They are very large, light-coloured and smooth-skinned, hold their heads high and carry themselves nobly. Their stride is great and they get over the ground swiftly, with little vertical motion. They do not thrive, however, out of the sandy tract of which they are natives. The Makran riding camel, which some esteem even better than the *dháti,* is a small, dark, shaggy animal, carrying its head low, but trotting fast and smoothly, though its pace is not equal to that of the *dháti.* It is hardy and enduring and better than any other on hilly ground, but its temper is shocking. The strongest baggage camels (*ládu uth*) come from the Hyderábád and the north of the Thar and Párkar Districts : those of the Sánghar Taluka are proverbial. The experience gained in the Afghan war proved that the camels of the plains were preferable for the transport on the hotter, or Indian, side, but succumbed at once to the cold of higher regions, while the hill camels perished by heat in the Bolan Pass, but were remarkably patient of cold. Camels are popularly supposed to have a natural aversion to water and not to thrive in damp regions, but in the Delta there are hundreds which feed habitually on the foliage of the mangrove, wading in the mud and even swimming the creeks. These coast camels are regarded as a distinct breed. The price of camels varies of course with their quality and age, but Rs. 150 may be put down as the price of a first class *tharri* riding camel : Makránis are rather cheaper. The average cost of baggage camels ranges from Rs. 50 to Rs. 80. About ten years ago there was an active trade in camels with western

Australia. During the years 1893-1897 about 4,500 were shipped from Karáchi to Fremantle. The majority of them came from Makran and Baluchistan, the hill camels being found better able to endure the Australian climate than those of Sind. In Australia they were sold at prices ranging from £ 30 to £ 100, but freight and customs duties came to £ 8 or 10 at least. **Live Stock.**

Camels are worked from the third year of their age and are in their prime till 12, but they will work for many years after that and may live to 40. The female has her first foal at the age of 4 (the period of gestation being about a year) and every second year or so after that until she has had 9 or 10. The rutting season is from December to March, at which time the male is apt to become *mast*, when he is savage and quite unmanageable. The female suckles her foal for a year and it is said that a good one will yield 12 *sers* of milk a day besides. The milk is universally used by Jats, but is at first laxative to those who are not Jats. It is considered a good medicine for disease of the spleen.

Most contradictory things have been written about the camel's powers of endurance, abstinence from food and water &c. There has been wild exaggeration on the one hand and undue depreciation on the other. As far as a general statement is safe, it may be said that a baggage camel can carry between 300 and 400 lbs. according to size, marching 20 miles a day. The rate will be something over 2 miles an hour for the whole distance. A good riding camel can trot at more than 6 miles an hour and will go 40 or even 50 miles a day at a slower rate : at a pinch 100 miles have been covered in a single day. But all special efforts demand special feeding on *gur* and flour, besides ample grazing. A camel accustomed to it will also go for several days without water. But if really overtaxed it collapses altogether and then it probably dies. Its greatest advantage as a transport animal is that the foliage of almost every tree or bush (with some important exceptions) is food to it and it can browse as it goes.

At the time of the first British connection with Sind there was a great trade in horses from Baluchistan and Khorassan, from which it may be inferred that the indigenous animal was not good enough for those who could afford a better. It is a small animal, rarely exceeding 14 hands in height, with light bone, weak hocks and loins, flat ribs and generally a bad colour. HORSES.

Live Stock.

These defects are the result of generations of inbreeding and also of using for pack and riding purposes when not matured, generally as yearlings. Notwithstanding these drawbacks they are a hardy race and can travel long distances on very little food. The measures adopted by Government for the improvement of the breed were in the hands of the Civil Veterinary Department from 1894 till 1903, when they were transferred to the Army Remount Department, Baluchistan Circle. Stallions were at first located at Jacobabad, Thul, Kandhkot, Kashmor, Shahdádpur, Shikárpur, Lárkána, Mírpur Mathelo, Badin, Tando Bágo, Naushahro Feroz, Darbelo and Moro; but after nine years' experience it became too clear that the Sindhi did not want them. Every effort was made to induce the more intelligent zamindars to take advantage of their opportunities, but with little success. From their point of view the Sindhi horse could not be improved, or at least was quite good enough. They had a notion also that the produce of an Arab or English thoroughbred could never be taught the *rawal*, that forced amble which carries the rider swiftly on his way without shaking the water in his stomach and is the glory of the Indian menage. The Remount Department has accordingly removed the stallions from most of the stations mentioned. They have been retained, however, in Jacobabad, Thul and Kandhkot, where the Baluchi breeders have different ideas and thoroughly appreciate their value. They have also been retained as a tentative measure for another year in Shikárpur and in the Tando Division, where there appears to be some hope. Although horse breeding has not flourished, mule breeding has made great strides. Donkey stallions are now standing all over Sind and are much appreciated by the people. Large numbers of young mules are purchased yearly by the Remount Department and Native Cavalry and many are sold to Sikh dealers from the Punjab.

ASSES.

The indigenous Sindhi ass (*gadah*) is of the small, dark grey, Indian breed, stunted by underfeeding and early and cruel oppression. Fine riding asses are often seen, but they come from Makran.

HORSE SHOWS.

Annual Horse Shows are held at Jacobabad, Shikárpur and Talhár in January and February, which bring together breeders and purchasers from all parts of Sind, the Punjab and Baluchistan,

Live Stock.

and afford a good opportunity of exhibiting the results of the Government measures for the encouragement of horse breeding. The Jacobabad Show is by far the most celebrated. The number of horses produced for exhibition at it last year (1906) was 1,464 and the sum given in prizes was Rs. 3,522. Most of the prizes were carried off by exhibitors from Baluchistan, but 294 of the exhibits were young stock from mares covered by Government stallions. Of the animals exhibited 135 were purchased on behalf of Government for cavalry purposes or the Police, while 230 animals were purchased by private persons for an aggregate price of Rs. 46,000. The Shikárpur Horse Show, though not so advantageously situated, is successful on a smaller scale. The Talhár Show is still an experiment.

CATTLE.

The cattle of Sind are among the best in India. The finest milch cows are to be found within a radius of 30 or 40 miles from Karáchi, chiefly in the hilly tracts, wherever there is grazing and water. The cows actually in milk are kept as near to Karáchi as practicable and the milk is sent in twice a day by camels. The owners are Musalmans, some of them wealthy men. They are particular in the selection of breeding bulls and keep records of pedigree. Bull calves from inferior milkers are castrated and sold for the plough. Sind cattle are not bred true to any type of form or colour, but are more or less recognisable. A rich red brown is the commonest colour, with white markings occasionally and a darker shade surrounding the eyes. They are of medium size, with long, deep, massive frame and short, well-set legs. The tail is long and the best cows show little droop in the hind quarters. The head is heavy, the neck short and thick and the dewlap much developed. Both bulls and cows are remarkably placid and tractable even with strangers. As milkers the cows have a very high reputation: 30 lbs. of milk a day (3 gallons) is said not to be an uncommon quantity for one cow to give. Consequently there is a great demand for them and large numbers are exported to Bombay, Poona, Mhow, Colombo, Quetta, and even Zanzibar. Another part of Sind noted for its cattle is the desert of Thar and Párkar, from which there is regular exportation to other parts of India, or was until the famine of 1899 almost exterminated the stocks. A good Sind cow costs from Rs. 45 to Rs. 60 (in the country) and a pair of bullocks from Rs. 60 to Rs. 80.

Live Stock.

BUFFALOES.

Buffaloes (*menh*) are found in large numbers in the Delta and on the banks of the Indus. The breed is like that of Delhi, characterised by short, curled, lateral horns, comparatively long legs and a short barrel, a good deal of hair and almost black colour. The smooth, long-bodied buffalo of Bombay, with its long scimitar-shaped horns, is unknown in Sind. But the Sind buffaloes are good milkers.

SHEEP.

Sheep (*ridh*) are found all over Sind, usually mingled with goats, particularly on the western hills and eastern desert, where nomadic shepherds subsist almost entirely on their produce. They are regularly milked with the goats and their wool is either sold or spun and woven by the shepherd and his family into blankets, saddle-bags &c. In Thar and Párkar the poor people mostly wear the woollen fabrics thus locally made. The Sind sheep of the plains, especially Thar and Párkar, are commonly of a light brown colour, leggy and hornless in both sexes. Their wool is long and abundant and in quality the best that is exported under the head of "Sind Wool." It is known as Nara Wool and it goes mostly to France. The *dumba*, or fat-tailed sheep, which belongs to the western hilly tracts, is robust and short-legged, white in colour, with black on the face and feet. The rams have large, curled horns. The chief claim to distinction of this breed lies in the quality of its mutton.

GOATS.

The thorny shrubbery of Sind is particularly suited to goats (*bakri*), which vastly outnumber the sheep in every District. They are for the most part large, high-standing animals, with plenty of hair, small heads, a peculiarly curved and short profile and pendent ears of ridiculous length. It is a curious fact that their horns, when developed at all, are distinctly of the markhor type, unlike the horns of the European goat, which are similar to those of the ibex.

POULTRY.

The only poultry much bred in Sind are common fowls. A few turkeys and even geese may be seen in the chief towns and a small flock of ducks occasionally. The fowls are scarcely equalled elsewhere in India. The stock Anglo-Indian jokes about the *moorghee* of the traveller's bungalow are pointless to a man who has lived only in Sind. This must be attributed to frequent importations from the Persian Gulf, the fowls of which are justly famous, and to the cock-fighting propensities of the people, which

have tended to keep up and improve the really noble breed known to home fanciers as Indian Game. Pigeons are plentiful everywhere and there are many pigeon fanciers in the country, who keep fantails, fantastic tumblers and other kinds.

Live Stock

DOGS AND CATS.

Dogs and cats need scarcely be mentioned. There is no indigenous dog but the pariah, showing often, by its shaggy coat and inordinately ferocious temper, traces of Persian or Afghan blood; for foreign hounds were formerly in great request among the sporting aristocracy of the country. Cats swarm beyond what is reasonable, but seldom show any marks of relationship to the fine cats of Persia. No one appears to care for them and they own themselves.

FAMINE.

Famine.

Famine is unknown in the Indus Valley, in which cultivation is independent of rain, but the desert portion of Thar and Párkar has had cruel experience of it. The year 1868-69 is still remembered as one in which the district was almost depopulated. The people, after spending money, ornaments and all else they possessed in efforts to save the cattle which are almost their sole means of livelihood, drove them westward to the Nára Valley; but the beasts were too emaciated to bear the journey and the change, and most of them perished. The lives of the impoverished owners and of many thousands of fugitives from Márwár in like condition were saved at the relief works started by the district officers. But that visitation appears to have been exceeded in severity by the drought of 1898 and 1899, when a very bad year was followed by one in which there was no rain at all. At the end of the second year the Deputy Commissioner reported that 95 per cent of the cattle had died, the remainder having been saved only by driving them to the Nára Valley, or to Baroda and other states. In February it was stated that there were not 40 cows left in the desert, from which there is normally a regular exportation of fine cattle. The exports of hides from the Shádipalli station alone rose in that year from 9,557 to 63,167 maunds and of bones from 17,820 to 46,647. Camels did not suffer quite so much, but $\frac{2}{3}$ of them were believed to have died. There was not one acre of cultivation in the desert. Nothing satisfactory can be gathered from the life statistics, because the desert was left almost uninhabited, and in the Nára Valley Division, to which the inhabitants

Famine.

resorted, they were mixed up with an unnumbered host of Márwáris in the same case as themselves. Altogether there were about 100,000 immigrants in the Nára Valley in a condition which made them a very easy prey to fever, dysentery and pneumonia, and to cholera when it came in May, 1900. The labouring classes had not much difficulty in getting work, but among respectable landholders and graziers, who could not be expected to work as coolies, much distress and humiliation were averted by small advances free of interest. In 1899-1900, Rs. 63,421 were spent in this way under the Famine Code and a further sum of Rs. 1,400 in the next three months.

The following are the official figures relative to this famine :—

Particulars.	1899-00.	1900-01.	1901-02.
1. Average number of persons relieved daily during the year	3,506	...	235
2. Mortality—			
a. Normal	5,557	5,557	5,557
b. Number of deaths over normal	11,703	6,216	1,420
c. Total deaths occurred during the year	17,260	11,773	6,977
3. Poor Houses	8	...	6
4. Loss of cattle	134,293	30,512	...
5. Expenditure—	Rs.	Rs.	Rs.
a. By Government	1,30,696	...	4,852
b. From Local and Charitable Funds	Rs. 1,15,066		
6. Advances and remissions granted—			
a. Takavi advances	„ 1,60,956		
b. Remissions of Land Revenue	„ 1,16,844		
c. Remissions of Takavi advances	„ 1,67,921*		

* Includes arrears of past years.

Though no other District was directly affected by the famine, the following expenditure was incurred in Karáchi in relieving

starving immigrants :— **Famine.**

1896-97	Rs. 937
1899-00	„ 2,142
1900-01	„ 355
1901-02	„ 128

There was less severe distress on account of failure of rain in the years of 1891-92 and 1895-96 and on account of the destruction of both harvests and pasture by locusts in 1860-61 and 1877-78. There are traditions of many famines before the conquest, particularly one in 1786, which exceeded in severity any known before or since. Rice was sold at 2 *sers* per rupee.

CHAPTER VI.

IRRIGATION.

Tables IX & X.

Irrigation.

HISTORY.

Sind has been irrigated by means of artificial canals from time immemorial. As far back as the 8th century we find that the Arab conquerors, in assessing their land tax, had to differentiate between land watered from the public canals and land watered privately by artificial means. To come to much more recent times, Captain (afterwards Sir) A. Burnes, going up the Western Nára in 1830, writes thus. "Its waters are courted and distributed by canals, which add to the blessings bestowed by nature on this flat and fertile land. The eastern bank, though less favoured than the opposite one, is highly cultivated, and most of the towns and villages stand on the verge of canals, which bountifully distribute the waters of the periodical swell and attest the industry and assiduity of the inhabitants." The Mírs levied an additional tax on lands watered from the state canals, but discharged very imperfectly their duty of repairing and clearing the same, so that in 1841 Lieutenant Postans wrote, "In repeated instances large tracts of fertile lands have become perfect wastes entirely owing to the neglected state of the canals." But the Jágírdars were more enlightened and, "knowing the increased value of their lands from increased means of irrigation, they expended largely to procure them, and employed Mianis to keep the canals constantly clear from the deposited slime of the inundations. The method of clearing water-courses adopted by this class of labourers is peculiar to Sind: they are attended in their work by musicians and the excitement is kept up by beating drums and blowing horns; without these they would make no progress, but with them the canal diggers of Sind will do more manual labour than any natives of India." After the British conquest the condition of the canals grew worse, the officers responsible for them being quite ignorant of the subject. Sir Charles Napier

organised a Canal Department, under Lt.-Col. Walter Scott, but his Assistants were not engineers and it was abolished in 1849 without anything having been accomplished. Mr. Frere's attention was directed to the subject immediately after his appointment in 1851 by John Jacob, and he got sanction to organise a new Department under Colonel Blois Turner, R.E. In the meantime John Jacob obtained permission to deepen and widen the Begári Canal at a cost of Rs. 1,30,000 and the resulting increase of revenue was estimated at more than a lakh per annum. Another scheme of Jacob's, the Desert Canal, was forwarded to Government in 1855, but not carried out till long after. In 1859 a channel connecting the Eastern Nára with the Indus at Rohri and converting the former into a perennial canal was opened with great *éclat*. This work was planned and carried out by Lieutenant J. G. Fife, R. E., who had already, in 1855, submitted a very able report on the remodelling of the whole canal system of the Province. Some quotations from it will elucidate the situation. "The canals in Sind are excavations carried away from the river in an oblique direction, so as to secure as great a fall per mile as possible; they vary from ten to one hundred feet in width, and from four to ten feet in depth. None of them have their heads where the river bank is permanent, and none of them are deep enough to draw off water from the river except during the inundation; the river has to rise many feet before the water will run into them. The general direction of the canals is often good, but they have so many intermediate awkward bends, that a great part of the fall is thrown away. They are irregular in shape, and irregular in slope or fall. They generally very nearly follow the slope of the country, so that in some places they have a fall of one foot per mile, in others only two or three inches. In fact, they resemble natural watercourses much more than canals. In some cases they are really old natural branches of the river kept open by annual clearance of the silt which accumulates in them during the inundation. They have all the same grand defects. The irregularity of their supply of water, arising from the variation of the inundation, is still further increased from the changes in the river channel at their heads; and from their becoming nearly always partly, and sometimes completely, choked with silt at their mouths.

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"The irrigation carried on by means of the canals may be classed under three heads, according to the elevation of the land. First, there is land on to which the water will not run without the aid of machinery. Second, there is land which is watered with the aid of machinery while the supply in the canal is low, but on to which the water will run without a lift when the canal is full. Third, there is land which is so low that after the canal is three parts full, the water can be run off without a lift, no machinery being ever used. The cultivation carried on in these three classes of land may be thus briefly described. In the first case, the cultivator has his cattle and servants ready by perhaps the 15th of May, to commence working the water-wheels, ploughing and sowing; but as the supply of water is dependent on the rise of the inundation, it never comes on the same date for two successive years, and of course his cattle and servants are kept idle till it does arrive. When the water at length makes its appearance work is commenced with activity and carried on steadily, unless, from the river suddenly falling, the supply of water should be cut off, in which case of course there is an interruption and the cattle and servants are again idle. After this a second subsidence of the river is rare and the work proceeds steadily, but it also proceeds slowly. The rate at which the sowing is carried on is dependent on the number of bullocks the cultivator can procure and of course, as at this period most of the other cultivators are similarly circumstanced, it is difficult to procure a sufficient number. The land is so hard and dry, that it must be watered before it can be ploughed. Time creeps on and before he has sown all his land the best period for sowing is past. However, as he commenced early, a very small portion only of his crop is poor from late sowing; and, on the whole, the crop is good, unless from the early subsidence of the inundation in August he has experienced difficulty in getting his water-wheels to throw up sufficient water, a subsidence of three or four feet in the level of the water doubling the labour and expense and halving the speed at which the irrigation is carried on. Should this early subsidence take place, some of his crop will be inferior from being insufficiently watered.

"In the second case, where the land is partly watered by machinery and partly without, the cultivator also waits the arrival

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of the water with his servants and cattle, and is during the early part of the season subject to the same losses and interruption. Later, however, he finds that the water is sufficiently high to run on to the land without a lift, and he therefore stops his wheel and employs all his cattle in ploughing. The sowing progresses rapidly, but a great part of it is late; matters progress favourably till the river begins to subside, when a difficulty immediately arises. The river falls perhaps three inches only, but the canals, owing to the mouth choking, fall a foot, and the water will no longer run on to the land without a lift. The wheel can do little more than water the land sown with its aid, the remainder of the crops suffers from want of water, and what was sown immediately before the water subsided utterly fails.

"In the third case, when the land is irrigated without the aid of machinery, the cultivator rarely commences till late in the season, as the canal must be nearly full of water, and this does not take place till the inundation period is half over; a great part of the crop is sown too late, and when it is juar or bajri, blight very frequently destroys it. This description of cultivation is, moreover, exposed to two most serious risks: either the water begins to subside too early, and two or three inches of subsidence renders it impossible to water the land, or from some unexpected rise in the river a greater quantity of water comes into the canal than can be used, it bursts its banks, and of course this description of land, which is always low, becomes inundated and the crop is partly, if not totally, destroyed.

"With the cultivation exposed to so many risks, arising from the capricious nature of the water supply, it cannot be matter for wonder that the people should look on the cultivation as a species of lottery. They are successful one season and bankrupts the next. No one who sows can tell what he will reap. Too little or too much water, the supply coming too soon or too late, and the blight arising from sowing at the wrong time, combine to render speculation on the result of the cultivation a riddle which none can solve."

After somewhat elaborate calculations leading to the conclusion that the Province lost 31 lakhs of rupees a year through the defects of its irrigation works, Mr. Fife proceeded to lay down certain sound principles which he considered ought to guide all

Irrigation. future operations. These may be stated briefly thus :—1. That, though existing canals should be properly cleaned and deepened at their mouths and provided with regulators at their heads in some cases, no new canal should be made on the old pattern. 2. That the head of a canal ought always to be situated at a place where the river bank is permanent. 3. That the stream of a canal must have sufficient velocity to sweep along the silt thrown in by the river. 4. That to this end there must be room to carry a canal along for a sufficient distance at a slope a little less than the slope of the country until it feeds the land at the proper level, which would probably not be less than 30 miles. 5. That the larger a canal is the less slope is required to give it the requisite velocity.

In accordance with these principles he sketched out four lines of canals, one leaving the river at Rohri and running parallel to its left bank at a distance of about 15 miles until it entered the Fuleli near Hyderábád; another leaving the river at Sukkur and running parallel to the right bank until it entered the Western Nára; the third and fourth leaving the left and right banks of the river respectively at Jerruck. The last of these was ultimately to reach Karáchi. He suggested a fifth canal as likely to be very beneficial to the country, running from Mithráo to Wanga Bazaar on the Eastern Nára. The first of these schemes was of alarming magnitude and was not adopted. In 1891 it was again urged by Mr. R. B. Joyner, Executive Engineer, Hyderábád Canals, but was rejected by the Sind Irrigation Commission. The Mithráo Canal was sanctioned at once, but met with many interruptions and was not completed until more than twenty years had passed. Mr. Fife's second project, the Sukkur Canal, was accepted in a very reduced and modified form and sanctioned in 1861. Since then the great Jamráo Canal and many minor new works have been carried out and a great deal has been done where practicable to enlarge and improve the old canals. At the end of 1904-05 the total mileage of completed canals was 7,441. The culturable area commanded by them was 95,37,670 acres and the area under actual cultivation in that year was 29,23,929 acres. The extraordinary increase in the population of Sind shown in the chapter on that subject has no doubt been due to this extension of cultivation more than to any other cause.

Irrigation.

ADMINISTRATION AND WORKING OF CANALS.

The growth of this department of public works has necessitated its division into ten Districts under as many Executive Engineers. These Districts are, the Begári, Shikárpur, Ghár, Western Nára, Karáchi, Northern Hyderábád, Central Hyderábád, Fuleli, Jamráo and Eastern Nára. The first five are under the Superintending Engineer, Indus Right Bank Division, and the rest under the corresponding Officer in the Left Bank Division. The Irrigation are not conterminous with the Revenue Districts, but Table X in each B. Volume gives statistics for every canal which traverses the District concerned.

All Government canals are in the charge of "canal officers" appointed under Sec. IV of Act VII of 1879. These are for administrative purposes the Superintending and Executive Engineers and their Subordinates. They are charged not only with the construction, maintenance and repair of canals, but with the issue of water from them and such supervision over the use of it as is necessary to prevent waste, provide for drainage and secure the best results from the supply available. The Collector, or Deputy Commissioner, of the District and his Assistant and Deputy Collectors in charge of Sub-divisions are also canal officers for various purposes under the Act. As the authority to grant land on any canal is vested in the Land Revenue Department, the officers of the two departments are required to co-operate under orders issued by the Commissioner in Sind from time to time. If the supply in a Government canal is deficient, it is placed under restrictions as to land grants; otherwise the Collector ordinarily grants land already settled on any canal if it is to be watered from a supply which the applicant already enjoys. But if a new, or materially increased, supply of water will be required, he consults the Engineers in charge of the canal. On the Jamrao and some other recently constructed canals, the delivery of water is strictly controlled by rules designed to secure impartial distribution, economy, proper drainage and the maximum aggregate result from the supply available; but in many of the old canals such ideals are unattainable and no attempt is made to attain them. Applications from landholders for permission to construct watercourses to their fields are made to the Executive and Assistant Engineers and granted by them. The applicant constructs the course at his own expense and thereafter becomes responsible for keeping it in proper repair. Only the sluice

Irrigation.

opening into it is constructed by the P. W. Department. No price is recovered for the water separately, that being an integral part of the assessment on the field (*vide* article on Land Revenue).

Water is let into the fields by flow (*mok*) if it stands at a sufficient level, otherwise by lift (*charkhi*), which means that it is raised by a *Nár*, or *Charkho* (a wheel turned by two bullocks or a camel), or a *Hurlo* (a wheel turned by one bullock). One method not infrequently has to give place to the other as the river rises or falls. The old canals were designed to flow during the inundation only and supply *kharif* cultivation, the water arriving at the fields about the beginning of June and ceasing to flow in September or some time later; but by flooding the fields just before the water subsides *rabi* crops can be grown to some extent on such canals. This is known as *Bosi* cultivation. In many low-lying parts a similar *rabi* cultivation is carried on in lands which are annually submerged by floods; but this, which is called *Sailábi*, has nothing to do with the irrigational system. The recent and more scientifically designed canals afford a perennial supply and irrigate both *kharif* and *rabi* crops. But crops and methods of cultivation are the subject of the article on Agriculture.

WELLS.

There is little irrigation by wells in Sind except in regions, like the Tabdaria Taluka in the Lárkána District, where water is found very near the surface, and on the margins of *dhands*: this does not differ materially from irrigation by lift on canals. Vegetable gardens and orchards, however, are very commonly watered from wells. Table IX shows the number of wells existing in each District.

Begari Canals District.

BEGARI CANALS DISTRICT.

The three big Canal Systems in this district are:—

1. The Desert Canal, or Sháhi Wah.
2. The Unhar Canal, now know as Unhar Wáh.
3. The Begári Canal.

All run in a direction from east to west.

Besides these and their distributaries there are a number small and unimportant canals, or watercourses, taking direct the river. Jacobábád is the head quarters of the Executive Engineer in charge.

Begari Canals District.

DESERT CANAL

The Desert Canal takes off from a *dhand*, or backwater, of the Indus, 6 miles east of Kashmor and 5 miles south of the Punjáb frontier. After traversing the northern portion of the Kashmor and Kandhkot Talukas, it enters the Thul Taluka and runs along the Kachhi boundary in British territory from its 46th mile to its tail in mile 69. The names and lengths of the distributaries, excluding watercourses kept up by the landholders, are :—

1.	Murádwah, 1 mile above Head Regulator, length	6	miles.
	Kandhkot Branch at 7th mile, with 5 minor distributaries, ... „	46	„
2.	Frontier Rájwah in 18th mile, with 4 minor distributaries, ... „	41	„
3.	Toj Rájwah at mile 19, with 2 distributaries, ... „	23	„
4.	Bugti Rájwah in 27th mile ... ... „	11	„
5.	Fall Rájwah in 27th mile ... ... „	25	„
	Fall Branch „ ... ... „	10½	„
6.	Ahmad Rájwah in 38th mile ... ... „	6½	„
7.	New Manjhi Rájwah at mile 41 ... ... „	5½	„
	Old Manjhi Rájwah at mile 42 ... ... „	1½	„
8.	Uch Rájwah in 45th mile ... ... „	29½	„
9.	Tháru Rájwah in 45th mile, including Branch, ... „	6½	„
	Thariri Branch in mile 45th ... ... „	4	„
10.	Mányuthi Branch in 52nd mile ... ... „	9	„

The Adiowáh, taking off the same *dhand* 8 miles above the Desert Canal mouth, is an independent canal, but is included in the same system. It is 19 miles long and has no branches. The total length of the distributaries is thus 244 miles and of the whole system 319 miles. Part of the Frontier and the whole of the Uch and Mányuthi Rájwahs irrigate land in Kachhi which has been leased by the British Government from the Khán of Kalát.

The Desert Canal has a bed width at the head of 83 feet, which is gradually diminished to 3 feet at the tail. The full supply depth at the head is 10 feet and the average hydraulic gradient 9 inches per mile. The canal is allowed to flow only during the inundation, when it carries a supply which in 1904 averaged 3,782 cubic feet of water per second and attained a maximum of 4,255 cubic feet. The head regulator was enlarged in 1902 and has cost Rs. 63,300 ; it now contains 9 openings, 1 of 15 feet

Begari Canals. District

span, 5 of 11 feet and 3 of 10 feet, which are fitted with wales and vertical needles lifted by a travelling crane. The 15 foot span acts as a boat pass, and boats might use the canal as far as the first fall, but do not.

The average annual cultivation on the Desert Canal is about 1,90,000 acres, of which about ⅔rds lie in the Frontier District and the rest in Kachhi. It is practically all on flow. The duty of the canal, or the number of acres irrigated per cubic foot of the supply, was thus 50 : theoretically it is 45. The average cost of clearance and repairs has been about Rs. 65,000.

The construction of this canal, which has converted a bare and unproductive plain into fertile cornfields and helped to wean the frontier tribes from inveterate habits of lawlessness and rapine, is due primarily to the initiative of General John Jacob. The richness of the soil and the level of the plain, which lay at a considerable depth below the Indus, suggested to General Jacob in 1854 a project which, though pressed by its author and approved by Government, was delayed by circumstances and not fully carried out for nearly 20 years. A beginning was made, however, with a small private watercourse called the Maksúdowáh, which was acquired by Government in 1856-57 and gradually extended and improved by the Frontier authorities with the help of landholders, who were given land on the condition that they assisted in the construction of the canal. In 1871-72 that canal, which was then some 40 miles in length, was transferred to the Irrigation department. Meanwhile, in 1870, the survey for the present canal had been undertaken and in 1873 work was commenced. The line originally sanctioned was 82 miles in length, of which the last 32 miles lay in Kachhi, but in 1875 an alteration to the present line, which is wholly within British territory, was approved. Numerous improvements upon the original design have been effected from time to time. Many difficulties have occurred at the mouth of the canal. Three times, in 1880-81, in 1886 and in 1892, movements of the river have made it necessary to provide a new connection at enormous cost. The expenditure incurred between 1881 and 1892 on these works amounted to Rs. 1,68,000. Since 1892 no material alteration has occurred in the course of the river and the financial results of the canal are

satisfactory and improving.

Begari Canals District.

YEAR.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent per year.
	Rs.	Rs.	Rs.	
1902-03 ...	25,91,395	2,68,883	1,59,784	6·17
1903-04 ...	26,46,386	3,81,632	2,48,870	9·40
1904-05 ...	27,05,990	3,54,760	2,18,640	8·04

ADIOWAH.

This originated in a watercourse dug by one Adiomal, which had been abandoned, but was re-opened and improved in 1903 in connection with the remodelling of the Desert Canal. It is treated as a part of that system, though actually quite a distinct canal. It leaves the river at the frontier of the Kashmor Taluka, 8 miles above the mouth of the Desert Canal, and has a total length of 19 miles, running along the Taluka boundary until it turns to join the Desert Canal near Sumar Baluch. There is a head regulator, with 3 spans of 10 feet each, a mile from the river bank, and a similar one where the canal crosses the Kashmor Band. The average discharge is 173 cusecs and the areas irrigated in the two years that have passed since its completion were :—

1903-04 ... ... 7,902 acres.
1904-05 ... ... 10,075 acres.

More than $\frac{4}{5}$th of the area was irrigated by flow. These figures, with the revenue results, are all included in the totals of the Desert Canal; likewise the capital cost, which was Rs. 1,03,859, and the small expenditure on repairs and clearance.

UNHAR CANAL.

The Unharwáh draws its supply from a channel of the river known as the Wadhu Dhand, which leaves the main stream just opposite the village of Bhanar in the south of the Kashmor Taluka. The mouth of the canal is situated in the Kandhkot Taluka and its course, 36 miles in length, lies through the Kandhkot and Thul Talukas. The names and lengths of the distributaries are :—

1. Ghauspurwáh in the 5th mile ... length 5 miles.
2. Tangwáni Branch in the 7th mile ... " 14 "
3. Nasírwáh at the 9th mile ... ... " 35 "
4. Saifalwáh in the 17th mile ... ... " 8 "

Begari Canals District.

The Unharwáh was originally a private watercourse. A project submitted in 1882-83 for its improvement and extension was sanctioned in 1884. The work was immediately commenced and was practically completed in 1887.

The bed width of the canal at the mouth is 68 feet and the designed depth of the full supply is 6½ feet, but as much as 9½ feet of water can be passed down with comparative safety. At the tail the bed width is 11 feet and depth 3 feet. A head regulator, completed in 1894 at a cost of Rs. 61,600, controls the supply at the point where the canal passes through the Kashmor-Begári Band, and a second built in 1896 at a cost of Rs. 57,000, in apprehension of the other being washed away, spans the canal at the 2nd mile. In the 5th mile the canal passes through a regulator-bridge built in the Reserve Band which is known as the Tori Stop Gate and is only intended for use in the event of the main embankment being breached.

The area under command is 2,14,000 acres, of which 77,300 on an average are annually cultivated. The average discharge is 1,708 cubic feet per second, which gives a duty of 45. The annual cost of clearance and repairs amounts to about Rs. 20,000.

The financial results of the canal are very satisfactory.

Year.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent per year.
	Rs.	Rs.	Rs.	
1902-03 ...	6,50,223	1,16,624	79,765	12·27
1903-04 ...	6,54,771	1,66,475	1,23,041	18·79
1904-05 ...	6,59,688	1,33,206	83,656	12·68

BEGARI CANAL

The Begári Canal leaves the Indus 33 miles north of Sukkur and for 53 miles forms the boundary between the Sukkur and Frontier Districts. Its course is then continued for 23 miles through the Jacobábád Taluka of the Frontier District and ends at Khairo Garhi, where an extension called the Sír Canal commences with a regulator at its head. Excluding watercourses maintained by the landholders, the canal throws off the following

Begari Canals District.

distributaries :—

1.	Sonwáh at mile 19	length	6 miles.
2.	Mirzawáh at mile 25	„	10 „
3.	Nurwáh at mile 38	„	19 „
4.	Idanwáh at mile 76	„	32 „
5.	Sír Canal at mile 76	„	15 „

The total length of the system is thus 158 miles. The last 13 miles of the Sír branch are in Kalát territory.

The Begári Canal existed at the time of the annexation and its name indicates that it was made by forced labour. The enlargement and extension of it was the first irrigation work pressed on the attention of Mr. (Sir Bartle) Frere after his arrival in Sind in 1851 by John Jacob, who had already induced the notorious free-booter Jamál Khan Dombki to set to work upon it with all the Baluchis under his control. Through Mr. Frere he now obtained permission to spend Rs. 1,30,000 and within the next three years the length was increased to 52 miles and the bed width at the mouth to 31 feet. At this time the Núrwáh was excavated to bring water to Jacobabad, which had been dependent on brackish wells. In 1856 the canal was extended to its present limit and the Idanwáh branch excavated for a short distance by the landholders. Other important extensions and improvements were made at intervals. The width at the mouth is now 100 feet and the full supply depth 12 feet. The normal discharge is 3,770 cubic feet per second, but 7,000 is the maximum and as much as 6,745 cubic feet per second passed down in 1904. The head regulator, situated a mile from the mouth, was completed in 1885-86 at a cost of Rs. 76,700 and consists of 9 openings, 6 of 10′, 2 of 12½′ and 1 of 15 feet, which last allows for a boat pass, but the canal is not used for navigation. A second regulator, constructed in 1880-81 at a cost of Rs. 38,700, controls the canal in the 19th mile below the mouth of the Sonwáh, and a third was constructed in 1885-86. Further extension and improvement are contemplated and surveys are under preparation.

The Begári Canal is a purely inundation canal, ceasing to flow, as a rule, early in January. It commands about 950 square miles. The average cultivation is 431 square miles, or 2,76,310 acres,

Begari Canals District.

more than $\frac{5}{6}$ of which are under flow. Of this area about 70 per cent. is in the Upper Sind Frontier District, 16 in the Sukkur District and 14 in the tract of Kalát territory which was taken over from the H. H. the Khán of Kalát on a perpetual lease in February, 1903, and is now known as the Nasírábád Sub-division of the Sibi District. The annual cost of clearance and repairs amounts to about Rs. 50,000.

The financial results are exhibited in the following table.

Year.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent for year.
	Rs.	Rs.	Rs.	
1902-03 ...	17,06,799	3,89,612	2,80,275	16·42
1903-04 ...	17,06,799	5,08,064	4,06,178	23.80
1904-05 ...	17,06,799	4,41,162	3,32,004	19·45

RIVER CANALS

Besides these the Begári Canals include nine small water-courses, leading direct from the river and irrigating in the aggregate 2,300 acres of land near its banks. The following statement furnishes particulars of them.

Name of Canal.	Situation of mouth.	Length.		Average.		Remarks.
				Cultivation.	Revenue	
		M.	F.	Acres.	Rs.	
1. Mírwah sluice ...	No channel, depending on flood water.	1	6	118	314	Unalienated Lands.
2. Darri sluice ...	Do. do. ...	0	6	42	120	
3. Gángiwah ...	3 Furlongs from Wadhu *dhand*.	0	2	197	528	
4. Kásimwah ...	2 Furlongs do. ...	0	1	241	584	
5. Míraniwah ...	5½ Miles from river	6	2	...	...	
6. Kháhiwah ...	3 Miles from Kalo *dhand* ...	5	2	260	629	
7. Sind Dhoro ...	2 Do. do. ...	1	7	421	1,403	
8. Nùrwah ...	M. F. 1 6 from Masùwala *dhand* ...	5	7	172	469	
9. Buxalíwáh ...	2 Furlongs do.	2	7	841	2,393	

Note.—The areas shown above represent the net area under cultivation.

Begari Canals District.

In table X in the B. Volumes these canals are included in "Works for which neither Capital nor Revenue Accounts are kept.—Kashmor Band."

PROTECTIVE EMBANKMENTS.

Prior to 1874 the Upper Sind Frontier District was yearly subject to inundation. In that year an exceptionally heavy flood swept away over 80 towns and villages and a good part of Jacobábád itself. To protect the country from these devastations the Kashmor Band project was commenced in the cold weather of 1874-75. During that working season a continuous line of *band* was constructed from the mouth of tho Begári canal, through Darri Tori, Ghorághat, Pipli and Badâni up to the Chandor Sand Hills, a distance of nearly 37 miles. In the next five miles towards Kashmor three openings, 680′, 800′ and 2,200′ in length respectively, were left, but from the 42nd mile again the *band* was made continuous and passed to the east of the Taluka town of Kashmor and finally in its 48th mile disappeared in the rising ground near the Sind Punjáb boundary line. In the inundation of 1875 several breaches occurred between Darri and Ghorághat and again in 1876 when there was also a breach below Darri nearer to Begári mouth. This year (1876) Colonel Sir W. L. Merewether, then Commissioner in Sind, brought to the notice of Government the imperative necessity of making this *band* complete and sound, and much work seems to have been done, so that in 1877 no breach occurred. Unfortunately, however, the following year happened to be one of very heavy flood and many breaches occurred all along the line, nearly 1½ miles of the *band* near Tori was washed away and two big gaps were made between Pipli and Badáni. During the next working season an entirely new loop was made from Darri through Daho to Ghorághat, the Pipli-Badâni breaches were made good and the 3 gaps in mile 37 and 42 were filled up, so that a continuous line of *band* was for the first time completed before the inundation of 1879, during which year the old *band* near Tori was also restored in order to form a reserve Loop Band. Since that time new loops have from time to time been constructed as the river breached or threatened the defences.

The aggregate capital expenditure on the protective embankments of the District has been nearly Rs. 20,00,000. The present length, from Begari Mouth to Kashmor, is 48 miles.

Shikarpur Canals District.

Shikarpur Canals District. The following canals are included in this charge :—

Seharwáh, Daharwáh, Máhiwáh, Masúwáh, Mahárowáh, on the left bank of the Indus; the Sind Canal System, on the right bank; and 9 petty canals, of which 6 are on the left bank and 3 on the right.

Besides these, the Nára Supply Channel is included in this district, but it will be described with the Eastern Nára, of which it is virtually a part. The Arorwáh, which is a branch of it irrigating the Sukkur District, is described below, after the Mahárowáh. The Executive Engineer in charge of this District has his headquarters at Sukkur.

SEHARWAH. The Seharwáh is wholly in the Ubáuro Taluka of the Sukkur District. Its length is 28 miles 2 furlongs. It takes off from the Guddú *Dhand*, near the village of Khambra in the extreme north of the Taluka, and runs, with an irregular course, southwards. It has no branches or distributaries maintained by Government. Its bed width at head is 15 feet. It has no regulator at its head. This is an old canal which was taken over by Government in the year 1884-85. Beyond being cleared no improvements have since been done to it. The Seharwáh Project of 1904, submitted to Government, contemplates the widening of the Canal and the construction of two new branches, as also some masonry works like bridges, regulators and sluices.

The average annual cultivation recently has been 5,426 acres, the proportion of lift to flow cultivation being about 1 to 7.

The annual expenditure on clearance and the revenue derived have been as under :—

Year.	Annual expenditure on clearance.	Annual revenue.
1902-03	Rs. 2,331	Rs. 8,135
1903-04	„ 2,590	„ 21,473
1904-05	„ 3,587	„ 12,684

DAHARWAH. The Daharwáh, named from the Dahar tribe, to whom it formerly belonged, is wholly in the Ubáuro and Mirpur Talukas of the Sukkur District. It takes off from the Máhiwah, near

Khambra village in the former Taluka, and runs irregularly a little west of south. Its length is 59 miles 2 furlongs. It has no branches or distributaries: the Dahar Feeders Nos. 1 and 2, which take off from the Máhiwáh, are included as branches in the Máhiwáh system. The present bed width of the Daharwáh at its head is 22 feet. It is an inundation canal only and not navigable. The portion below the 30th mile was widened and a zamindari *karia*, the Gawhar, at its tail taken over and improved under the Revised Máhiwáh Project, 1902. In the Revised Máhiwáh Project, 1904, it is contemplated to include the Daharwáh in the Máhiwáh system. It will be divided up into separate distributaries and branches of the Máhiwáh.

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The cultivation on the Daharwáh for the last three years has been:—

1902-03	... ...	8,622 Acres.
1903-04	... ...	45,177 „
1904-05	... ...	19,318 „

The average of lift to flow cultivation is about 2 to 3.

The annual expenditure on clearance and the revenue derived have been as under:—

Year.	Annual expenditures on clearance.	Annual revenue.
1902-03	Rs. 3,080	Rs. 43,929
1903-04	„ 2,950	„ 77,558
1904-05	„ 4,447	„ 46,237.

MAHIWAH.

The Máhiwáh, length 28 miles 6½ furlongs, is wholly in the Sukkur District. It takes off from the Guddú *Dhand*, near Khumbra village in the extreme north of the Ubáuro Taluka, and runs in a south-westerly direction through the Ubáuro and Mirpur Talukas, tailing eventually into the Masúwáh at the 20th mile of the latter. It has the following branches and distributaries:—

BRANCHES.

Name.	Length.		Mile of main canal from which branch takes off.
	M.	Fur.	
1. Dahar Fedeer No. 1	4	5	5th mile Máhiwáh.
2. Dahar Feeder No. 2	4	3	23th do.
3. Kander	18	3	24th do.
4. Maharo*	3	4	30th do. Mile Masúwah.

* This is really a branch of the Masúwáh, though included in the Máhiwáh system.

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DISTRIBUTARIES.

Canal or Branch from which distributaries take off.	No. of distributaries.	Total length of distributaries.	
		Miles.	Furlongs.
1. Máhiwáh, Right Bank	25	22	7
2. Máhiwáh, Left Bank	27	22	5½
3. Dahar Feeder, No. 1, Right Bank	3		
4. Do Left Bank	3	12	3
5. Do No. 2, Right Bank	2		
6. Do „ Left Bank	2		
7. Kander Branch, Right Bank	12	14	4
8. Do „ Left Bank	13	14	3
	Total	86	6½

Thus the aggregate length of the system is 146½ miles.

The bed width of the Máhiwáh Main at mouth is 50 feet. It has a head regulator at its 1st mile, 2nd furlong, and others in its 5th, 23rd, 24th and 27th miles, all recently constructed and costing about Rs. 70,000. Each of the branches is also regulated. It is an inundation canal and not intended for navigation, but admits boats of ordinary size. The Máhiwáh system was constructed in 1901 to meet a want felt on account of the cessation of the floods which used in former years to traverse the Mírpur and Ubáuro Talukas, and was put into operation for the first time in the inundation of 1901. Some extensions were carried out in the years 1902, 1903 and 1904 and a revised Máhiwáh Project of 1904 has been submitted to Government. It contemplates the enlargement and extension of the system. The name Máhiwáh is derived from the Old Zamindari Máhiwáh, a small canal which is situated in the Ubáuro Taluka.

The average discharge for the last three years has been :—

1902-03	... ...	415 Cusecs.
1903-04	... ...	777 „
1904-05	... ...	531 „

The annual cultivation and the duty of the Máhiwáh system

Shikarpur Canals District.

have been as under:—

Year.	Annual cultivation in acres.	Duty in acres per cubic foot per second of discharge.
1902-03	8,622	21
1903-04	45,177	58
1904-05	29,356	54

The average ratio of lift to flow cultivation is about 1 to 2½.

The annual expenditure on clearance and the revenue derived have been as under:—

Year.	Annual expenditure on clearance.	Annual revenue.
1902-03	Rs. 12,142	Rs. 21,990
1903-04	„ 14,529	„ 119,839
1904-05	„ 12,995	„ 75,508

The capital cost of the system up to date has been Rs. 10,74,755; and the system has brought in a return to Government of 5·4 % on the outlay after deducting maintenance charges &c.

MASUWAH.

The Masúwáh is wholly in the Sukkur District. Its mouth is from the Khariri *Dhand,* in the Rawti forest in the Ubáuro Taluka, and it runs irregularly in a south-westerly direction for 34 miles 2 furlongs. It is reckoned to have no branches or distributaries, the Maháro, Branch No. 4, which takes off near its 30th mile, being included in the Máhiwáh system. The present bed width at its head is 14 feet. The Ghotki Canal Project, 1904, contemplates the taking over of the Masúwáh as a branch of the Ghotki Canal. The Masúwáh is an inundation canal, not used for navigation.

The average cultivation on the Masúwáh for the last three years has been:—

1902-03	17,171	Acres.
1903-04	5,366	„
1904-05	3,500	„

The average of lift to flow cultivation is about 1 to 3.

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The annual expenditure on clearance and the revenue derived have been as under:—

Year.	Annual expenditure on clearance.	Annual revenue.
1902-03	Rs. 1,253	Rs. 44,133
1903-04	„ 2,528	„ 15,329
1904-05	„ 3,043	„ 9,762

MAHAROWAH.

The Mahárowáh is wholly in the Sukkur District. Its mouth is from the Khariri *Dhand,* in tha Rawti forest in the Ubáuro Taluka, just near the mouth of the Masúwáh. Its length is 45 miles and its direction a little west of south. It has no branches or distributaries and is not regulated. Its present bed width at its head is 14 feet. It is an old inundation canal, not intended for navigation. Under the Ghotki Canal Project, 1904, it is proposed to abandon it and to irrigate lands now dependent on it from the Masúwáh and the Ghotki Canal system.

The average cultivation on the Mahárowáh for the last three years has been:—

1902-03	... ...	5,463 Acres.
1903-04	... ...	4,046 „
1904-05	... ...	2,542 „

The average ratio of lift to flow cultivation is about 5 to 8.

The annual expenditure on clearance and the revenue derived have been as under:—

Year.	Annual expenditure on clearance.	Annual revenue.
1902-03	Rs. 935	Rs. 11,902
1903-04	„ 1,409	„ 11,924
1904-05	„ 3,056	„ 7,408

ARORWAH.

This is a canal, 13¾ miles, in length, by which a little of the water of the Nára Supply Channel (q. v. under Eastern Nára District) is utilised for irrigation in the Sukkur District. It has one branch, the Umerkhas, both being old inundation canals. The Arorwah takes off from the Nára Supply Channel, above its head

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regulator, and has a bed width of 20 feet. It has no distributaries, but gives off the Umerkhas in its first mile. The bed width of the Umerkhas is 10 feet. The average cultivation on the two during the last three years has been as follows, the ratio of lift to flow being about 1 to 2½ :—

1902-03	...	...	15,950 acres.
1903-04	...	...	19,836 „
1904-05	...	...	16,759 „

The annual cost of clearance and revenue are shown below :—

	Cost cf Clearance.	Revenue.
1902-03...	...Rs. 3,699	Rs. 29,372
1903-04...	... „ 2,767	„ 34,795
1904-05...	... „ 3,886	„ 33,211

The following small canals are also on the left of the river.

LUNDI WAH.

An old inundation canal, 8¾ miles in length, in the Ghotki Taluka. The average area cultivated on it is about 2,000 acres, half by lift and half by flow. The average annual expenditure recently on clearance &c., has been Rs. 3,760 and the revenue about Rs. 6,000. The Ghotki Canal Project involves the abandonment of this canal.

DENGRO WAH

Also an old inundation canal. The average cultivation on it has been about 9,000 acres, about ⅘th being by flow. The average annual expenditure has been about Rs. 6,000 and the revenue about Rs. 27,000. The partial abandonment and partial amalgamation with another system of this canal are contemplated.

KORAI WAH.

This old canal, a work no doubt of the Korái tribe, takes off from the Gemro *Dhand* in the Ghotki Taluka, and has a length of 19½ miles and a bed width of 16 feet. The average cultivation sustained by it recently has been about 12,000 acres, producing a revenue of nearly Rs. 32,000. The annual cost of clearance has been about Rs. 4,500 per annum. About ⅘th of the cultivation is by flow. When the Ghotki Canal Project is carried out part of this canal will be abandoned and part converted.

MAHESRO WAH

This has its mouth in the same *Dhand*. It is another old canal, 9 miles long, the abandonment or amalgamation of which is under consideration. The average cultivation

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on it has been 3,500 acres, the cost of clearance about Rs. 900 and the revenue about Rs. 10,000.

JANIB WAH.

This, which takes off from the same *Dhand* as the last, but in the Pano Akil Taluka, is very similar and will also be abandoned if proposed new schemes are carried out. Its bed width is only 6 feet and its length less than 7 miles. It supports nearly 800 acres of cultivation on the average. The annual expenditure on clearance is about Rs. 300 and the revenue about Rs. 1,700.

MIR WAH.

This is an old canal less than two miles long and 7 feet in breadth, which is annually cleared at a cost of Rs. 800 or so and supports 900 acres of cultivation yielding over Rs. 4,000 in revenue. It takes off from the river a little below Rohri.

SIND CANAL SYSTEM.

The Sind Canal, length 42½ miles, is wholly in the Sukkur District. It has a mouth from the Indus, near Loí village in the Shikárpur Taluka, and forms the boundary of the Sukkur and Shikárpur Talukas for 34½ miles. It has the following branches and finally tails into the Mirwah:—

NAME.	Length in miles and furlongs.		Mile of canal in which Branch takes off.	
	M.	F.		
1. Mirzáwáh	16	4	9th mile Sind Canal.	
2. Channel No. 1	16	2	13th	do.
3. Raiswáh	9	0½	26th	do.
4. Chhota Begári	7	0	26th	do.
5. Channel No. 2	11	7	29th	do.
6. Munghirwáh...	21	0½	37th	do.

Also Feeders and Escapes, in length 7½ miles. The total length of this system is thus 131¾ miles. The bed width of the canal at mouth is 60 feet. It has a head regulator at a distance of 4 miles 2 furlongs below its mouth from the river, and a regulator at its tail in the 43rd mile. The 4¼ miles between the river and the head regulator are not part of the Sind Canal, but a "feeder" to it, constructed in 1900-01. It has an escape regulator 3 furlongs from its junction with the Sind Canal. The

Sind Canal is an old inundation canal, not designed nor much used for navigation, but it admits boats of ordinary size. The Sind Canal system was widened and extended in the year 1896-97, and minor improvements have since been made in it from time to time. A complete remodelling of it is at present under contemplation. **Shikarpur Canals District.**

The average discharge for the last three years has been :—

1902-03 ...	... 1,020	cubic feet per second.
1903-04 ...	... 1,613	do.
1904-05 ...	... 1,250	do.

The annual cultivation and the duty on the whole Sind Canal system have been :—

YEAR.	Annual cultivation in acres.	Average duty in acres per cubic foot per second of discharge.
1902-03	53,612	52
1903-04	91,956	57
1904-05	80,398	64

The proportion of lift to flow cultivation is about 1 to 4.

The annual expenditure on clearance and the revenue derived have been :—

YEAR.	Annual expenditure on clearance.	Annual revenue.
1902-03	Rs. 41,807	Rs. 1,70,625
1903-04	„ 58,510	„ 2,97,031
1904-05	„ 37,872	„ 2,71,820

The following small canals take their rise from the right bank of the river in the Sukkur Taluka.

RAJIB WAH.

11¼ miles long, improved in 1900-01, cultivation nearly 8,000 acres, annual expenditure about Rs. 4,000, average revenue Rs. 29,000.

CHHITTI.

11¼ miles long, much improved between 1900 and 1902, cultivation 10,000 acres, revenue Rs. 40,000, annual cost about Rs. 4,000.

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GARANG WAH.

$11\frac{3}{4}$ miles long, meets the Sukkur Canal, under which it is carried by an iron siphon 3 feet in diameter, cultivation 5,000 to 6,000 acres, revenue about Rs. 20,000, cost about Rs. 4,500.

NEW PROJECTS

Three schemes are at present under consideration which, if carried out, will largely transform the irrigational system of the portion of the District which lies on the left of the Indus.

The Ghotki Canal Project, 1904, estimated to cost Rs. 26,59,405, is for a new canal to irrigate the Ubáuro, Mírpur, Ghotki, Pano Akil and Rohri Talukas. The Maháro, Lundi, Dengro, Mahesro, Korái and Jánib Canals are to be abandoned, except that portion of each of the last five which lies north of the Railway, and the Masu is to be improved and amalgamated with the Ghotki Canal.

The Korái Canal Project, 1904, provides for a new canal to supply those lands between the river and the Railway which are now dependent on the Mahesro, Korái and Jánib.

The Bakro Canal Project, 1904, similarly supersedes the portion of the Dengrowah north of the Railway.

EMBANKMENTS.

The Sukkur Begari Band is situated on the right bank of the Indus River in the Talukas of Sukkur and Shikárpur. Its length is $50\frac{1}{2}$ miles. This *band* originally consisted of several portions, belonging to zamindars. The first portion constructed by Government, in 1869, was the one near the Sukkur Canal. The Zamindari bands were taken over by the Public Works Department in the year 1878. Thorough repairs were carried out in the year 1879, since which 18 new loops have been constructed to support the embankment at various weak points.

Five breaches have occurred since 1890, some of them extensive, but the damage done was in no case serious.

The Kasimpur Band is situated on the left Bank of the Indus River in the Rohri Taluka. Its present length is $10\frac{1}{2}$ miles. This band was first constructed in the year 1875. Four loops have since been added. This *band* has been breached four times since 1890, but without damage to crops.

The Naich Band, an old zamindari work, is situated in the Mirpur and Pano Akil Talukas of the Sukkur District. It is an inland *band* and is on the left bank of the river.

The following villages of the Mírpur Taluka are near to this band. **Shikarpur Canals District.**

Hayat Pitafi, Bhiri Laghári, Khánpur, Sháhpur; and the following villages of the Pano-Akil Taluka, Mubarakpur, Ropahár.

The total length of this *band*, including an extension made in 1902, is 34 miles.

There are a *band* 28 miles long on the right bank of the Máhiwáh, connected with the Naich, and several others, the importance of which will disappear after the construction of the Rohri Division Protective Band Project, 1904, at present under preparation. This line of *band* will extend from the mouth of the Seharwah and pass the mouth of the Máhiwah and of the proposed Ghotki Canal; it will then run on the left bank of the river at a distance of from about 3 to 8 miles, on *paka* land, and finally join the Kasimpur Band.

Ghar Canals District.

Ghar Canals District.

This district comprises two large and important canals, the Sukkur and Ghár, with their branches. These last include the Nasratwáh, which is now a distinct canal, but, having originally been a branch of the Ghár, is still treated as part of it for administrative purposes. The area irrigated by the two systems comprises part of the Sukkur and Naushahro Abro Talukas of the Sukkur District, the Ratodero and part of the Lárkána, Kambar and Nasirábád Talukas of the Lárkána District and part of the Shahdádpur Taluka of the Upper Sind Frontier District. The Executive Engineer in charge has his headquarters at Lárkána.

SUKKUR CANAL.

The Sukkur canal takes off from the right bank of the Indus immediately above the island of Bukkur at a point where the bed is rocky, and, after a course of 39 miles through the Sukkur and Naushahro Abro Talukas of the Sukkur District, traverses the Ratodero Taluka of the Larkana District for 21 miles and finally comes to an end in the Shahdádpur Taluka of the Frontier District. The total length of the main canal, excluding the new mouth, is 72·31 miles.

The canal, as now existing, was constructed between 1865 and 1870 and consists of portions of old canals linked together and enlarged. After passing into the Shahdádpur Taluka of the

Ghar Canals District.

Frontier District it bifurcates into the Maksudowah and a new channel extending 10 miles westward, the latter being the proper continuation of the Sukkur canal, commonly called Nápat Sukkur. In the spring of 1872, in consequence of the vast amount of sand deposited in the head of the canal, a new head 2 miles in length was constructed, joining the canal near the 3·62 mile. Since then the supply has been chiefly drawn during the inundation from this, the "Rahuja" head, the original mouth being mostly reserved for supplying the canal in the *rabi* season, though it is occasionally used in the inundation also to supplement the other when the river is low.

The supply is controlled by a head regulator at Sukkur, and by another on the Rahuja mouth. These regulators are not constructed to pass boats and the canal is not used for navigation The Rahuja channel, near its junction with the main canal, descends over falls to a lower level, and is controlled at this point by a second regulator. Regulators are also provided on the main canal at miles 39, 49, 54, 64, 66, 69 and 73. The average discharge gauged below the junction of the mouths of the Sukkur Canal during the past four years was 2122 cubic feet per second in the *kharif* season and 425 in the *rabi.* This canal flows for about 9 months, from 10th June to 15th March.

The following is a list of the present distributaries of the Sukkur Canal.

Alíbahar and Sind Sanhri in mile 22	length 6·44	miles.
Kur Khairo in mile 40	„ 18·32	„
Kur Biro in mile 40	„ 24·18	„
Kur Maksudo in mile 64	„ 6	„
Idan Canal in mile 73	„ 11·49	„

The Idan canal is also fed by the Ghár during the *kharif* season through the Sháhji and Dáteji branches. In addition to these, a large number of private watercourses are supplied directly from the main canal through masonry sluices.

The gross area under command is 2,46,713 acres, of which 1,64,248 acres are culturable. The average area under cultivation during the 3 years ending with 1903-04 was 93,455 acres, being 38 per cent. of the gross area and 57 per cent. of the culturable area. The *rabi* cultivation amounts to a little more than one-quarter of the whole. The area under lift is about 12 per cent. of the whole.

The financial results of the Sukkur canal are exhibited in the following table :— **Ghar Canals District.**

Year.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent. for year.
	Rs.	Rs.	Rs.	
1902-03	14,12,934	1,42,357	78,570	5·56
1903-04	14,21,017	1,77,208	1,02,408	7·21
1904-05	14,25,974	1,45,034	49,155	3·45

The average cost of clearance and repairs was Rs. 27,538.

The Ghár canal appears to be one of those natural channels through which the Indus has for centuries discharged a portion of its swollen flood. The tortuous course and the absence of all remains of old spoil banks point to such an origin. The branch canals were constructed by the land-holders under native rule and have been gradually taken over by the British Government. The canal issues from the Indus in the Naushahro Abro Taluka of the Sukkur District about 30 miles south of Sukkur. No regulator has been constructed at the head owing to the uncertain behaviour of the river. The Nasratwah, which was formerly a branch of the Ghár, has now, on account of the erosion of the head portion of the Ghár, an independent mouth in the river just above the mouth of the Ghar. The Nasratwah is 10·31 miles long and has a tail called the Kadowáh of 12·75 miles. A former branch of the Nasrat, the Kur Maksudo, was incorporated into the Sukkur canal. GHAR CANAL.

The Mírwah, 15·37 miles long, takes off at the 8th mile of the Ghár Canal, from the right bank, and the Hiráwah, 11·38 miles in length, takes off from the right bank in the 22nd mile. Close to the Hiráwah and from the same bank, a large branch called the Sháh Hamir takes off. The length of the Sháh Hamir itself is 10 miles, but it has a tail known as the Kursháh 25 miles long, and a branch called the Chathowáh 6·75 miles in length. At its 25th mile the Ghár is joined by a feeder channel, the Fordwah, 4 miles long, which was constructed in 1855 by Captain St. Clair Ford, the then Deputy Collector. In its 30th mile the canal passes through the town of Larkana. Six miles further a small

Ghar Canals District.

branch, the Gháriwah, 7·61 miles in length, takes off from the left bank; and at the 37th mile the Ghár throws off from the right bank a large branch, called the Kur Dato, which is 26 miles in length and not regulated. In the 39th mile the Ghar bifurcates, the Western extension being called the Nurwah and the southern branch the Naurangwah. The former is 12·75 miles long and the latter 8 miles; neither is regulated. The Naurang bifurcates into the Gathwah and Chílowah, neither of which is regulated. The Gath is 6·5 miles in length, but its tail, known as the Nasírwah, is 21 miles long, and it throws off a small branch called the Kur Rato, which is 3·62 miles in length. The Chílowah is 16·75 miles long and throws off from the right bank three branches (a) called the Kur Hashim for 3·87 miles and Nekar for 11·2 miles beyond, (b) the Mírwah 18 miles long and (c) the Sanhro Chílo 7·37 miles long. After the last the Chílo continues as the Vicholo for 6·12 miles till it is cut by the Dhamráo of the W. Nara system. The total length of the whole system, including the Nasratwah, is thus 297 miles. The Ghár is an inundation canal and is navigable during the season for 38 miles. Several of its branches, the Kur Dato, Naurang, Nurwah, Chílo and Gath are also partially navigable.

The gross area under the command of the Ghár and Nasrat Canals is 5,05,649 acres, comprised within the Ratodero, Larkana, Kambar and Nasirábád Talukas, and the Gaibidero Jagir of the Larkana District and the Shahdadpur Taluka of the Frontier District. The Nasratwah irrigates about 16,277 acres in the Ratodero and Larkana Talukas and in the Naushahro Abro Taluka of the Sukkur District. The culturable area under command is 3,87,338 acres, and the average cultivation during the three years ending with 1903-04 was 2,72,078 acres, exclusive of 94,492 acres twice cropped. Of this 2,16,216 acres were *kharif* and 55,862 *rabí*. The cultivation on this system therefore amounts to 53 p. c. of the total area, and 70 p. c. of the culturable area under command, and it is owing to the efficiency of the canal, which these figures indicate, that this part of the Lárkána District has deserved the appellation of the Garden of Sind. Practically the whole of the cultivation is on flow.

Ghar Canals District.

In the marginal table the average and maximum discharges of the channels from the river which feed the Ghár canals system, are presented.

Canal.	Average discharge in 1904.	Maximum discharge in 1904.
Ghár Canal	2,610	5,288
Fordwah	1,459	3,489
Nasratwah	368	707

The financial results are remarkable. The figures for the three years ending with 1904-05 are exhibited in the following table.

Year.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent. for year.
	Rs.	Rs.	Rs.	
1902-03	4,51,181	6,35,760	4,70,793	104·39
1903-04	4,51,181	6,85,976	5,28,092	117·05
1904-05	5,70,139	6,15,810	4,68,070	82·10

The average cost of clearance and repairs has been Rs. 61,113 and of clearance only Rs. 33,264.

EMBANKMENTS.

The total length of River Bands in the Ghar Canals District is 45·80 miles as under :—

Saidabad Band	8 miles.
Jhali Band	22·25 „
Mitho Band	3·93 „
Phulu Band	11·62 „

The above local names have now been discontinued and all the *bands* in charge of this District are now called the "Ghar Bands." The *band* line practically is continuous, except for a portion of about 8 miles between the Ghar mouth and the end of Mitho Band. Like the other great lines of embankment, it has been frequently strengthened, or re-enforced with loops, at great expense, as the river eroded one part or another.

The Western Nara District.

The canals comprised in this district are those which supply the greater part of the Lárkána District, namely the great Western Nára, with its numerous branches, and the Aral River

The Western Nara District.

and Manchhar Lake and a number of minor independent canals in the Dádu and Sehwán Talukas; also six small canals in the Kotri Taluka of the Karachi District. The Executive Engineer in charge has his headquarters at Lárkana.

WESTERN NARA.

The Western Nára is a natural and very tortuous channel by which a portion of the Indus waters find their way to the Manchhar Lake and so back again into the main stream near Sehwán. It now issues from the river near the village of Akil in the Lárkána Taluka, 8 miles east of Lárkána. The distance from the head of the Nára to the Manchhar is 83 miles in a straight line, but 153½ miles measured along its course. It formerly started much further north, but between 1860 and 1880 some 20 miles of it were eroded by the Indus till it came to be fed from the latter near the village of Abád. The present mouth was excavated in 1902-03 and enlarged in 1905. It connects the natural mouth at 5 furlongs above the Nao Abád bridge with the Akil *Dhand* nearly 8 miles distant. The supply is controlled by a head regulator originally constructed in 1903 at a cost of Rs. 32,320 and enlarged in 1906 at a cost of Rs. 31,110. It has ten openings of 11 feet and one, the boat passage, of 20 feet. These are fitted with steel wales and a double row of teakwood needles. The bed width of the channel is now 125 feet and the depth of water during the full supply 11 feet.

In 1892-93 the "New Feeder" channel was excavated from the Indus near to the village of Kumbhar in the Labdaria Taluka, joining the Nára in its 33rd mile near the village of Tatri. This channel, which is 7¾ miles long, has been provided with a head regulator at a cost of Rs. 30,760, which also provides a passage for boats 14 feet wide. The New Feeder was completed in 1897-98 and cost, with all its works, Rs. 1,55,011. Its bed width is 50 feet and its full supply depth 12. Another feeder, completed in 1893-94 at a cost of more than 3 lakhs and named in honour of Sir Charles Pritchard, late Commissioner in Sind, has its mouth in an old river channel in Mehar Taluka and enters the Nára in its 95th mile after a course of 24½ miles, during which it irrigates the country through which it passes. Its bed width is 50 feet and full supply depth 10. In its head regulator there is a 14 foot passage for boats. The Pritchard Canal has five small irrigational branches with an aggregate length of about 22½ miles.

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Besides the two feeders above-mentioned the Nára has the following distributing branches :—

Name of branch.	Mileage of Main Canal at which branch takes off.		Length of branch including all sub-branches maintained by Government.	
	Miles.	Furlongs.	Miles.	Furlongs.
1. Distributary	Just above Head Regulator.		5	1
2. Gillespie Wah	1	2 from Abád Bridge.	16	6
3. Gowar Wah	9	4	11	7
4. Arthur Wah	9	4	10	4
5. Monder Wah	14	3	12	0
6. Dhámrao Canal	32	6	54	7
7. Gulmuhammad Wah	54	0	19	6
8. Ráj Wah	54	0	19	3½
9. Kakol Wah	58	4	19	6
10. Kudan Wah	61	7	19	4½
11. Masáhar Wah	71	7	5	7
12. Khuda Wah	75	6	7	6
13. Pejáho Wah	78	5	1	6
14. Kálro Wah	79	7	2	3
15. Lohri Wah	89	1	6	0
16. Káro Wah...	113	3	3	5
17. Lower Nur Wah	113	4	8	2
18. New Gáribi	120	3	4	1
19. Old Gáribi...	126	6	6	0
20. Dingri	124	6	8	3
21. Mákaki Wahur	131	4	16	0
22. Sákro Wah	135	4	3	2
23. Kur Aktar	140	3	3	4

The most important of these is the Dhámrao Canal, which leaves the Nára just where the New Feeder enters it and irrigates a large part of the Mehar Taluka. In its course of 30 miles it throws off 6 branches with an aggregate length of about 25 miles more. This canal is a new work, begun in 1894 and completed in 1898 at a cost of Rs. 2,76,241. The Gillespie Wah and the Kudan Wah complete their courses by re-entering the Nára.

The total length of the Nára and all its branches is 266 miles and the area irrigated by it, taking an average from the last three years, is 206,687 acres, of which 169,939 are by flow and 36,748 by lift. The Nára is not a perennial canal, but some water continues to flow in it until December and a certain amount of *rabi* cultivation (36,184 of the total given above) is carried on by means of it. The average full supply discharge of water into the

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canal since its enlargement is designed to be :—

By its own mouth ...	...	4,564	cubic feet per second.
By the New Feeder ...	...	1,625	ditto.
By the Pritchard Canal	...	1,600	ditto.
Total	...	7,789	

The quantity out of this which eventually finds its way to the Manchhar Lake is not large. In a good year it was found not to exceed 13,000 cubic feet.

No capital account is kept for the Nára. The average revenue from it in the three years ending 1904-05 was Rs. 6,05,279 and the average cost of entire maintenance Rs. 69,902.

In the days when most of the trade of Sind was carried on by the Indus the Western Nára was preferred to the main stream during the inundation because the strength of the current was less. It is still much used by boats and the regulators, sluices and bridges on it are all constructed with this in view. This applies also to the New Feeder and the Pritchard Canal.

THE ARAL RIVER AND MANCHHAR LAKE.

The Aral River, 17 miles in length, is the southern end of the Nára from the point where it leaves the Manchhar Lake, which may be regarded as a local expansion of its channel, to the point where it rejoins the parent river. The Aral leaves the Lake at its extreme southeast point and flows east then northeast till it reaches Sehwán, where it is joined by a branch called the Dunstarwáh, which has left the lake at a point about four miles further north than the Aral. After rounding Sehwán the combined river turns and runs southwards till it enters the Indus at a point which, in the present condition of the banks of that river, is not far from Bhagatora Station. But the Aral does not always run in one direction. During the inundation, when the level of the Indus is much above that of the Manchhar, its current is reversed and it becomes a feeder of the Lake and a much more important one than the Nára, the waters of which are dissipated in irrigation. As soon as the inundation subsides, the Aral again serves to discharge the Lake. As the cultivation on the lands exposed by the drying of the Manchhar is extensive and valuable, it is a problem of some importance how to regulate the Aral so as to fill the Manchhar during the inundation to the outer fringe of the area of *rabi* cultivation and

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then to drain it as dry as possible in time for the August sowing. Many proposals have been made and some costly experiments tried, without much result, including the importation of an expensive dredger from England, which proved to be a white elephant. Recently a simple expedient has been tried which appears to work well and may be improved. Near to Sehwán the Aral is joined by a channel, about 2 miles in length, called Chario Wáhur, which connects it with the river at a point higher than its own mouth and acts as a feeder to it during the inundation. Since 1900 the Aral has annually been stopped by a temporary dam just before the inundation set in, immediately below the junction of the Chario Wáhur and the Aral, so that the whole of the water coming down by the former channel, much of which would naturally flow down and into the Indus again by the Aral mouth, is forced into the Manchhar Lake. But by the end of September the dam is removed, leaving a free course to the drainage of the lake by the Aral mouth. The Aral has been partially canalised. The average cultivation on it, the Dunstarwah and the Manchhar Lake during the three years ending 1904-05 is shown below. The average revenue during the same period was Rs. 80,257 and the expenditure on maintenance and repairs Rs. 1,480.

Aral	... 8,136 acres.
Dunstarwah ...	... 2,917 acres.
Manchhar Lake ...	... 20,750 acres.

The following are small main river canals.

Wáhur Wah. Takes off the same Wáhur which feeds the Pritchard Canal and is 4 miles in length. Irrigates 2,151 acres; revenue Rs. 6,160.

Márui Wah. Takes off the same Wáhur, length 15½ miles. This is an old canal taken over by Government in 1870. It is now regulated and irrigates parts of the Mehar, Kakar and Dádu Talukas, 3,637 acres in all, yielding revenue Rs. 9,557.

Upper Núr Wah This is also an old canal, taken over in 1882. It takes off from the river opposite Deh Kháriro in Dádu Taluka and discharges into the Ghari. Its length is nearly 15 miles and it supplies 4,746 acres on the average, with revenue of Rs. 10,190.

Kolab Siál. This takes off from a Wahur about 6 furlongs to

the east of Sháh Alam village in Deh Shaháni in Dadu Taluka, and tails into *Dhand* Kolab Sial near Vander village in the same Taluka. It has two branches, Ghári and Wádhu, inclusive of which its length is 20 miles. It irrigates an average of 4,967 acres, with revenue of Rs. 11,236.

Phito Canal. This canal, which is 40½ miles in length, irrigates portions of the Dádu and Sehwán Talukas, taking off from an old river bed about a mile above Jhalo village in the former and discharging into a *dhoro* near New Karampur village in the latter. It irrigates 4,598 acres, with revenue of Rs. 10,645.

The following, which are in the Karáchi Collectorate, were transferred to the Western Nára District in 1903.

Káro Wah. Nearly 14 miles long, taking off from the river about 2 miles southeast of Sann village and returning to it about 2 miles south of Mánjhand Station. It has a regulator near its tail for flooding lands when necessary.

Sháh Panjo. This takes off about a mile and 6 furlongs below the head of the last and, after a course of a little over 8 miles, discharges into the Government forest of Núrpur Butho.

Butho Wáh. This rises about a mile and a hálf below the last and has a course of 3 miles.

Bagdád Wah. Length 8½ miles. It takes off about a mile north of Khánot village and discharges into the Sadábahár Canal about a mile north of Unarpur Station.

Chhandan Vachhero. Takes off from the river about a mile southeast of Bhian village and discharges into the last.

Sadábahár Canal. This takes off about half a mile below the mouth of the last and has a course of more than 20 miles. Accounts have not been separately kept for these canals, which all irrigate the Kotri Taluka. The average area supplied by them during the three years just passed was 8,279 acres, of which 4,553 were on flow and the rest on lift. The average revenue was Rs. 19,785 and the cost of maintenance Rs. 6,734.

Phulu Band. The only portion of this band in charge of the Western Nára district is that comprised between Mile 40, Furlong 6 (where the new mouth of the Western Nára traverses the *band*) and Mile 42, Furlong 7 (where the *band* ends on the right bank of the old mouth of the Nára). This portion was transferred

from the Ghár Canals district on account of the construction of the said new mouth.

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Gap Band. Is the name given to a mile of embankment linking the Phulu and Abád Bands.

Nára Bands. These form a continuous chain of embankments extending for 60¾ miles along the right bank of the river from near Nao Abad village, on the efficiency of which depends not only the cultivation of a large area of fertile country, but the safety of the railway line. Most of the constituent parts are old zamindari *bands*, which, falling into disrepair, were taken over by by the P. W. Department. They are known by the following names:—

Abad Band, 18 miles; Nangesháh Band, 12 miles; Lashári Band, 9 miles, 5 furlongs; Magsi Band, 7 miles, 1 furlong; Rajána Band, 5 miles; Rukan Band, 10 miles; Fatehpur Band, 7¾ miles. Parts of this line have been repeatedly breached. In 1892 the river forced itself through the Rukan Band and caused heavy damage to the country and the railway. It is said that a goods train was engulphed by the sudden rush of water. This was before the P. W. Department had taken charge of the band. In 1894 there was a serious break in the Lashári section, when a large extent of country was flooded.

Mánjhand Band. This, the only important *band* in the Kotri-Manjhand section of the District, commences at Butho village and ends east of the Kotri-Sehwan road. It is 5¾ miles in length.

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The canals of this district are all in the Delta, where the problems of irrigation are somewhat different from those encountered in upper and central Sind. For while this region is, over a great extent of it, annually submerged and depends upon that submergence for its fertility, it is also intersected by countless channels, each of which may have been the main bed of the river and all of which serve still to carry flood waters to the sea. There is therefore little room for any new, artificial canals, but much need to restore, or reform, and control those constructed by nature, so that they may supply water when it is wanted and carry it off when it is not. Every chief canal in the district is an old river bed and the works on them are principally dams,

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embankments and drains. The great canals are five, the Baghár, Pinyári, Kalri, Sattáh and Khánto, which, with their branches, traverse the Talukas of Tatta, Mírpur Bathoro, Sujáwal, Játi, Sháhbandar, Ghorábári and Mírpur Sákro, supporting cultivation over an area of 126,000 acres and yielding an average revenue of Rs. 3,46,000. There are also about a hundred smaller canals, of which no separate account can be attempted here. The aggregate cultivation on them averages 41,000 acres and the revenue derived therefrom Rs. 1,11,000. The Executive Engineer in charge of this District has his headquarters at Karáchi.

BAGHAR CANAL.

A map dated 1817 shows this canal as the main channel of the Indus. It was called the "Baghár darya." It had so strong a current that below Mírpur Sákro, 53 miles from the present mouth, people were afraid to cross it in boats. But Lieutenant A. Burnes, writing in 1831, relates that for three years its channel had been deserted by the river. It still contained water enough to carry flat-bottomed boats and the country near it was as rich as before. After that it silted up annually and its discharge gradually decreased. In the cold weather it dried, the sand in its bed flew about and wells had to be sunk in it for water. Moreover sea water used to come up beyond Mírpur Sákro. In 1878 an attempt was made to dam the part called the Shísha creek, at the 80th mile, near the village of Khagán in Mírpur Sákro, to shut out the sea and hold up the level of the fresh water. The work was nearly finished when in May the river suddenly rose and washed it away. No attempt was made to restore it. Its cost was about Rs. 10,000. In 1884 a new head from the river was excavated. This greatly improved the supply and prevented sea water coming up within 37 miles of Mírpur Sákro during the inundation, but in the cold weather the sea water reaches as far as Mírpur Sákro. About 1887 embankments were commenced on both sides of the canal. In 1891-92 a sea creek called the Kháriro, about 6½ miles below the village of Buhára, was turned into a fresh water canal by a cut made to it from the Baghár nearly a mile long. An earthen dam about 1,200 feet long was thrown across it at the 13th mile to shut out the sea water and two escape sluices were provided, one at each flank, by which the height of the fresh water could be regulated. In 1892 the construction of the side embankments was continued above

Pír Patho and commenced above Mírpur Sákro, about Rs. 10,000 being then expended. The work was completed in 1898 at a cost of Rs. 53,842. The canal is now embanked on both sides for nearly the whole length from the head to the Ladhia canal, five miles above Mírpur Sákro, only a comparatively small portion where it is in naturally high ground being left unembanked.

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This canal is the largest, though not the most important to agriculture, in the Karachi Canals district. It takes off from the right bank of the Indus at North Latitude 24° 39′ 30″, East Longitude 68° 0′, and after a circuitous course of about 90 miles, with a generally western direction, tails into the Shisha creek. It runs through the Tatta, Mírpur Sákro and Ghorábári Talukas and has the following principal villages on its banks:—Tánka near the head, Pír Patho at 22, War-jo-goth at 25, Gulámallah at 30, Mírpur Sákro at 58 and Buhára at 62 miles. The Khariro takes off in the 69th mile and below this the canal is called the Shisha. It has 11 branches, totalling 63·15 miles in length, and from it and these there are some 2,000 *karias* or distributaries.

At the head it has a top width of 200 feet and a depth of about 18 feet when the Kotri gauge reads 20 feet. The maximum discharge was formerly as much as 7,400 cubic feet per second, but through some gradual and unaccountable fall of the river during the past five years it does not average this figure now. Under normal conditions the canal flows from April to December. Its course is very tortuous and there are a good many crocodiles in it, which destroy animals and occasionally human beings.

There are at present no large masonry works on the canal. Only a few of the branch canals and distributaries have brickwork sluices where they pass through the side embankments. The remodelling of distributaries and provision of *paka karia* heads of suitable size at the mouths of *karias*, or the provision of *rájbuhas* is under consideration; also the construction of one or two new distributaries. During the cold season repairs are carried out and the embankments strengthened and raised where necessary. In the cold season also the necessary clearance and repairs of the branch canals are carried out. The main canal requires no clearance as its current is sufficient to preserve a sufficient section, although at places its banks fall in and at others a considerable amount of silt is deposited.

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To obtain the maximum efficiency of the canal the Bukkur gauge should reach 15 feet (Kotri gauge 20 feet). With a 14 feet Bukkur reading the *kharif* crops will be properly served, but the *rabi* crops require a higher one. The most favourable inundation is when the Indus begins to rise early in May, reaches Bukkur 12 feet by the middle of June, and then goes gradually up to 15 feet and remains there during July and August without exceeding it, and does not fall below 12 feet by the middle of September. Unfortunately these conditions have not been obtained for the past few years. The average area cultivated during the past three years amounts to 25,464 acres, of which $\frac{1}{5}$th is by lift and the rest by flow. The revenue has been Rs. 54,909 and the cost of clearance Rs. 12,155.

There is a little boat traffic on the canal during the inundation season. The Indus boats go as far as Mírpur Sákro, and occasionally to Pimbhri, which is lower down and a few miles above the main sea creeks. They carry firewood and grain for the Karáchi market and their cargoes are transhipped to sea boats which come up the creeks from Karáchi. These latter come as far as Pír Patho with swali rafters, flour and cloth &c.

PINYARI CANAL.

Originally the Pinyári was a branch of the Indus. Irrigation was practised from it in the time of the Mírs. Their principal work was a massive *band* across its tail at mile 73, two miles below Mughulbhín and near the site of the present Gungro escape sluice, which was designed to hold up the level of the water and prevent its escape to the sea. To pass off excess supply this *band* used to be cut and then remade, but this method of working was naturally expensive and attended with danger, while the rice cultivation frequently suffered from deficiency of supply.

A few side embankments were made at low places below the take off of the Ghári branch and some branch canals were made: from these and the main canal numerous distributaries led off. With the old system it was not possible to raise the water level so high as is now done and breaches and overflows were more frequent. The result was that the highest lands could not be cultivated for want of water, nor the lowest lands because an excess supply swamped them. A very large area in Sujáwal was left uncultivated from this latter cause.

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The bifurcation of the main canal into the Shorwáh and Chhotá-Pinyári and the alignment of the branch canals are, however, evidences of considerable engineering skill on the part of the former rulers. The general system was to enclose low lands by canals and banks to prevent their being flooded and to irrigate those by flow of which the level was suitable. The principal improvements effected since the British conquest are the regulation by brickwork regulators of the supply and levels of the main canal and its branches, a few embankments and a series of *chhandans*, or drainage channels, to drain off after the inundation the water which accumulates in the low-lying lands, or *dhands*. The head regulator is situated about 5½ miles from the Indus : it consists of 12 spans of 10′ 6″ and a boat passage of 20′ and on top is a roadway. Below the bifurcation are two regulators across the branches, Shorwáh and Chhota-Pinyári, and at the tail is the Gúngro escape sluice by which, when necessary, the supply is prevented from passing uselessly to the sea. Embankments, *Chhandans* and other works were added from time to time.

This canal is the second in point of size in the Karáchi Canals District, but the first with respect to the area irrigated and the revenue produced. It takes off from the left bank of the Indus at North Latitude 24° 58′ 30″ and East Longitude 68° 20′ where that river makes a very sharp double bend, or "horse shoe," below the high ground south of Jerruck on the right bank. Its general course is due south and is fairly straight until, after a length of 73 miles, it enters the Sír creek at Mughulbhin (Játi). The head portion, 26 miles long, is known as Pinyári, then comes the bifurcation into Chhota-Pinyári and Shorwah, 7 miles 3 furlongs and 3 miles long, respectively ; below this is Achh Chhandan, 5 miles long, below this Chhejo, 5 miles long. It is here joined by the Káro-Gúngro, or tail of the Múlchand Canal, the most easterly of the Fuleli Canal District in Hyderábád Collectorate. Below Chhejo it is known as the Gúngro, which is 32 miles long. It flows through the Mírpur Bathoro, Sujáwal and Játi Talukas and has the following principal towns and villages on its banks, or on those of its branches; Bano, Atalsháh, Laikpur, Daro, Dari, Vásusháh, Mirzo Laghári and Mughulbhin, Mírpur Bathoro, Sujawál, Budho Talpur, Mulá, Buhár. It practically irrigates the whole of Mírpur Bathoro and Játi and a great part of Sujáwal. It has 33 branches, totalling 240 miles in length,

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and from it and these there are 3,088 *karias*, or distributaries. At the head it has a top width of about 150 feet and a maximum depth of 12·20 feet. The maximum discharge which has been gauged is 4,500 cubic feet per second. The canal usually begins to flow for a few days towards the end of April: it then stops and begins to flow continuously from the middle of May to the middle of September. Since the construction of the head regulator, crocodiles, which formerly abounded, have disappeared.

The structures on the canal are of brickwork; the principal are :—

(a) Head Regulator at 3 miles, cost	Rs. 56,819,	in 1881-82.
(b) Cross Regulator at 11 miles, 7 furlongs,	Rs. 49,447,	in 1903-04.
(c) Shorwah Regulator at 27 miles	„ 16,381,	in 1884-85.
(d) Chhota-Pinyári at 27 miles	„ 9,201,	in 1884-85.
(e) Gúngro tail escape at 73 miles	„ 23,351,	in 1878-79.

In the fair season the necessary clearance and repairs of the branch canals are carried out. The main canal requires no clearance as its current maintains a sufficient section, but in recent years it has been found necessary to clear the head, as it gets silted by drift sand. A good many breaches occur annually, especially at the drainage sluices in the upper parts.

For the proper working of the canal the Indus should rise to 9′ on the Bukkur gauge (Kotri 13′) at the end of April, to enable water to enter it for ploughing and sowing. It should then rise continually to 14′ on the Bukkur (Kotri 18′) in August, and should not fall below Bukkur 13′ (Kotri 17′) till the middle of September. Down to Wálisháh in the 13th mile the irrigation is chiefly by lift: thereafter it is mostly by flow. The area irrigated by lift is about $\frac{1}{10}$th of the whole.

This part of the district, especially near Sujáwal, is low lying and has many depressions, which get filled with water percolation from the higher lands, by breaches and by the tail discharge of the distributaries, and are known as *dhands*. A peculiar kind of rice known as *motia* is sown in them and this is able to grow to a height of from 6 to 10 feet as the water rises. If the rise of water is gradual the rice plants are able to keep pace with it, but should it be sudden, they are overtopped and drowned. The margins of the *dhands* are cultivated as far as the rise of water will allow. In March or at the beginning of April the seed is

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sown broadcast over all the margins of the *dhands* not under water, where it germinates at once. No transplantation takes place to the lower lands in the *dhand*. Where necessary small embankments known as *baná* are constructed round fields to prevent the crops being submerged and every effort is made to reduce too great depth of water by draining the lands back into the Pinyári when its level is sufficiently low. The rice is able to survive submersion up to about 10 days in clear but not in muddy water.

To enable reaping to be carried out and to get dry land for stacking and treading out the crop, the drainage channels are opened about the middle of September and the surplus water passed into the Pinyári, which by that time is low. Reaping is done from boats while the depth of water is over 3 feet: its cost in the lowest parts is said to be half the value of the crop. When the water is less than 3 feet the reapers wade in. On the high lands a different kind of rice called *ganja* is grown which is transplanted as soon as the canal flow is properly established.

In the first 14 miles of the canal are numerous mango groves which receive water from it by percolation and drainage.

Revenue statistics for the last three years ending 1904-05 have been—

Year.	Total area under cultivation.	Revenue.	Total cost of repairs and clearance.
	Acres.	Rs.	Rs.
1902-03	72,511	2,24,405	23,333
1903-04	79,168	2,32,710	30,994
1904-05	74,618	2,16,026	33,833

There is very little navigation on this canal and the traffic has decreased since the construction of head regulator.

KALRI CANAL, 36.

This canal was originally an important branch of the Indus, but the river changed its course and left it about 130 years ago. Previous to 1893 the only improvements made to the canal were a few straightenings of its course. In 1895-96, a head regulator of brickwork was built at a cost of Rs. 15,918; this consists of five

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spans of 10 feet and one of 15 feet for a boat passage. Since its construction the flooding of the country which formerly occurred annually has been prevented.

This canal is the third largest in the Karáchi Canals district. It takes off from the right bank of the Indus at North Latitude 24° 47′ and East Longitude 68° 2′. Its general direction is nearly south-west, but its course is a very tortuous one. It runs through the Tatta and Mírpur Sákro Talukas. The following principal towns and villages are on the canal and its branches; Tatta Nareja, Gujo and Bábra.

For the first 26 miles this canal is known as the Kalri and has one main branch Nari-chhachh near its head, which supplies a network of seven minor branches. Thereafter it bifurcates into two branches. Of these the Kalri Buthro leaves at right angles and, after a very circuitous course, is connected with the Baghár by the Rájwah branch. A large portion of this, the *Chhachh*, is abandoned: the total length maintained is 12 miles 5 furlongs. The second branch, which is in continuation of the main canal, is called the Khánawah and is maintained for 10½ miles to the point at which the Jámwah leaves it. For the remainder of its length it is abandoned and dry and has a tortuous and divided course, its original main channel being continued in the Gháro creek, up which salt water still comes as far as a few miles past the village of that name and enables boat traffic to be carried on with Karachi. The total length of the present canal from Kalri head to the tail of Jámwah is about 43 miles. The Jámwah, which branches off at the head of the abandoned part of Khánahwáh, is 6½ miles long and is connected by the Dhúrwáh with the Baghár Canal. The number of branch canals is 11 and their total length is 65 miles; from them there are 1,171 *karias* or distributaries. Thus the aggregate length of the system is 108 miles. At the head the canal has a top width of 50 feet. Its depth is restricted to 12½ feet at the regulator and its maximum discharge to about 1,000 cubic feet per second. It generally ceases to flow about the end of September.

The structures on the canal are all of brickwork. The principal are :—

Head Regulator on the main canal.

Head Regulator on Ghár Kalán, 36/5.

Head Regulator on Jámwah, 36/14.

Local Fund road bridges, four on the main canal and fifteen on the branches : the latter are mostly small.

The supply in the Kalri has to be kept low owing to the defective state of its first main branch, the Nári Chhachh. The result is that a restriction has been placed on new irrigation and before this can be removed the canal must be improved.

Not much is spent on maintenance. The first two miles of the canal's left bank are bounded by the Panáh-Baghár river *band*, which is patrolled during the inundation season. The main canal, where it has silted badly, and the branch ones are annually cleared of silt.

The most favourable inundation for this canal is the same as that described under Baghár Canal. About $\frac{1}{4}$th of the area irrigated is by lift and the rest by flow. The *kharif* season is by far the more important of the two on this canal. No water is given to *rabi* crops, the moisture in the ground being sufficient for them.

There is practically no traffic on the canal, but small boats come from the Indus as far as the Tatta-Jerruck road bridges in the 5th mile.

The average area under cultivation in the three years ending 1904-05 was 12,011 acres. The average revenue was Rs. 30,683 and the cost of maintenance Rs. 14,614.

Originally this was a channel of the Indus and it was perennial and flowed into the sea below Sháhbandar at the time when that port was established in the middle of the 18th century. The river then changed its course, the mouth of the Sattáh silted up, its width throughout became reduced and it was converted into an irrigation canal. SATTAH CANAL, 80.

In 1895-96 a head regulator was constructed at a cost of Rs. 21,328 about 2½ miles from its head, where the Bahádipur loop of the river *band* crosses it. Further improvements, consisting of (1) excavating a new head, (2) widening the existing

Karachi Canals District.

channel, (3) constructing 5 regulators over the Sattáh and its branch Rájwah and (4) constructing 93 masonry sluices over *karias* from both the main and branch canals, have been carried out in the year 1903-04. The original bottom width of the Sattáh was 22 feet at its head and this has been increased to 42 feet. The head regulator has two spans of 9 feet and one of 15, and cost Rs. 21,328. The total cost of the improvements has been Rs. 1,17,455.

This canal is the fourth largest in the Karáchi Canals district. It takes off from the left bank of the Indus at North Latitude 24° 25′ 30″ and East Longitude 68° 1′ from a large *kohri*, or river backwater. Previous to 1893 it took off from the river direct, but in that year the Indus changed its course to the west. Its general course is south-east and it tails into a *dhoro* or old creek of the same name, and this extends to the sea. Its total length as maintained for irrigation is 26 miles, after which it is covered with thick jungle and has silted up to nearly ground level. It runs through the north-east corner of Sháhbandar Taluka, except the middle portion, which is in Játi. The principal villages on it are, Chuhar-Jamáli, Ládiun, Lándhi and Kothi. It has one main branch, the Rájwah, taking off at the 12th mile, the length of which is 6 miles.

For the proper working of this canal the Kotri gauge should read 15′ by the middle of May, 17′ by the middle of June, 19′ during July and August and should not fall below 17′ before the middle of September. About $\frac{1}{10}$th of the area irrigated is by lift and the rest by flow.

Small boats used to go down this canal and then up the Hájia Canal to Játi before the year 1903, but since the constructon of the regulators this traffic has been stopped.

The area of cultivation on this canal in the year 1904-05, since the great improvements effected in it, was 9,486 acres and the revenue Rs. 25,349. The cost of clearance was Rs. 3,655. It is now on the list of canals for which a capital account is kept and the financial result of its first year is shown below :—

	Capital cost to end of year.	Gross revenue.	Net revenue.	Net return.
1904-05 ...	Rs. 1,16,313	Rs. 25,349	Rs. 19,925	17·13

Karachi Canals District.

Originally this canal was a perennial branch of the Indus, entering the Sattáh. It was affected similarly to that canal by the change in the course of the river. In 1895-96 a head regulator was constructed across it, at a cost of Rs. 15,837, in the 2nd mile, where it is crossed by the Bahádipur loop of the river *band*. No further improvements have been made to it.

KHANTO CANAL, 82.

This canal takes off from the left bank of the Indus at North Latitude 24° 24′ and East Longitude 68° 0′ from the same *kohri*, or river backwater, that feeds the Sattáh, and like it prior to 1893 took off from the Indus direct. Its general course is nearly due south and it tails into the Sattáh *dhoro*, or old creek near Sháhbandar. Its length is 24 miles, of which the first 20 are maintained for irrigation. It runs entirely in the Sháhbandar Taluka. The principal villages on it are Máchhi, Jungo-Jalbáni and Sháhbandar. It supplies two main branch canals with a length of 11 miles, and 484 *karias*, or distributaries. At its head it has a top width of 40 feet and a full supply depth of 10½ feet. Its maximum discharge has not been gauged, but is probably about 500 cubic feet per second. In 1894, the Kadirdinosháh river *band* was extensively breached and much damage was caused to this canal. In order to give the Indus more waterway and thus reduce its flood level against the *bands* upstream, the Kadirdinosháh *band* was abandoned and in its place an embankment 19 miles long was constructed in 1895 on the right bank of this canal to shut out the river floods.

For the proper working of this canal the Kotri gauge should read 15′ by the middle of May, 17′ by the middle of June, 19′ during July and August, and should not fall below 17′ before the middle of September. The whole of the area irrigated is by flow.

Little else than *kharif* rice is grown on this canal. Previous to 1895, when the head regulator was constructed, there was a little boat traffic down to Jungo-Jalbáni. No boat passage was provided in the regulator on account of the small traffic and there is consequently no navigation now.

The average area of cultivation during the three years ending 1904-05 was 4,481 acres, the revenue Rs. 12,724 and the annual cost of maintenance Rs. 1,873.

Karachi Canals District.

EMBANKMENTS.

The *bands* in the Karáchi District are numerous and disconnected, having been raised from time to time at places where the river showed a tendency to overflow its banks. The following are the principal:—

On the Right Bank.

1. *Sonda Hilaya Band,* 9 miles 530 feet long, running from Sonda village to mile 14/6 on the Tatta-Jerruck road. This was made about 1887 and was once breached, but is reckoned safe now.

2. *Panáh Baghár Band,* 12¾ miles long, beginning at the Makli hills and ending at the crossing of the road between Tatta and Baghár. This is a very ancient *band* which has been breached and repaired and strengthened more than once.

3. *Bághar Uchito Band.* This is also an old work, but has been fortified by loops in five places since 1900. It extends from the mouth of the Baghár to near Uderolál, a distance of nearly 39½ miles.

On the Left Bank.

Mulchand Sháhbandar Band. This runs in four sections from the extreme north of the Mírpur Bathoro Taluka to the 2nd bridge on the Khánto Canal, where the Sháhbandar road crosses it. The first is 20⅓ miles long, to the Rajwah: it gives little trouble, and the date of its origin is not known. The second, running from the Rájwah to the Gungri, was commenced in part as early as 1864 and many times strengthened since and supplemented by loops, being very liable to erosion. It is 29¼ miles in length. The third section, from the Gúngri to the Khánto, 13⅓ miles long, was first made in 1880 and had to be fortified with loops in many places subsequently; but it has not been breached since 1897. The fourth section runs for 18 miles along the right bank of the Khánto Canal, of which it was at first the embankment; but as it was found that the Indus refused to be confined by the old Kadirdinoshah *Band* on its left bank, that was abandoned, and the Khánto *Band* was made the line of defence in 1894. It has never been breached.

Northern Hyderabad Canals District.

NORTHERN HYDERABAD CANALS.

NORTHERN HYDERABAD CANALS DISTRICT.

The Northern Hyderabad Canals District includes 5 large and 5 minor canals which issue from the river in the Kandiaro and

Naushahro Talukas. The total length of main canals is 301 miles and of branches 531 miles. The canals are all ancient; the larger ones, the Naulákhi, Nasrat, Dád and Dambhro, were probably old channels of the river adapted to the purposes of irrigation. They never follow the ridge lines, but pursue a devious course through depressions. The levels and alignment therefore of the old sections are both bad, though the great length of the new sections and the slope of the country from north to south have enabled the engineers to obviate these disadvantages in aligning the extensions of the Nasrat and Dád Canals. With the exception of the Nasrat, the canals afford a supply only during the inundation, and on the Nasrat system the supply is not perennial, as the branches have to be closed for clearance. The Dambhro, Nasrat and Dád are the only canals possessing head-regulators; the two latter are also the only canals for which a capital account is now kept. The total annual cultivation on the Northern Hyderabad Canals system is 2,25,404 acres, of which a little more than one-half is under flow irrigation. The gross revenue is Rs. 4,91,312 and the expenditure on clearance Rs. 1,38,966. The system is managed by an Executive Engineer whose headquarters are in Hyderabad.

Northern Hyderabad Canals District.

MEHRAB CANAL.

The Mehrab Canal, which irrigates the northern portion of the Kandiaro Taluka, is an inundation canal 29 miles long, with three branches having a combined length of 14 miles. It derives its supply from the river through an old channel known as the Lundi *Dhand.* Up to 1884 the canal issued from the river at a point some 20 miles further north in the Khairpur State, but the inconvenience resulting from the absence of control in the most important section induced the British government in that year to construct a new mouth in its own territory. The new section, 13 miles in length, was completed in 1884-85 at a cost of Rs. 52,797. But the unavoidable alignment of the section from west to east, when the gradient of the district was from north to south, has reduced the head of water so that the area under flow irrigation has been diminished. The anticipated return on capital has not been obtained and the canal was removed from the list of productive works in 1903. The average annual cultivation is 13,490 acres, of which more than two-thirds is by lift; the gross revenue amounts to Rs. 30,230 and the cost of clearance to Rs. 7,835. The canal carries during the inundation season an average supply of 189 cubic feet per second. The maximum is

Northern Hyderabad Canals District.

450 feet. The duty of water in 1904-05 amounted to 81.

NASRAT CANAL

The Nasrat Canal issues from the same river channel as the Mehrab, the Lundi *Dhand* in Kandiaro. The original canal, which is said to have been constructed by Nasrat Khan Chandio in the reign of Nur Muhammad Kalhora (1719-1754), drew its supply from another channel, Gangan, 10 miles below the Lundi *Dhand*, near Gulsháh, the Indus being further to the east, and after a course of some 20 miles terminated in the north-eastern corner of the Naushahro Taluka. In recent years the canal has been entirely reformed and vastly extended, the latest improvement being the extension of its length from 30 to 79 miles and the increase of its bed width from 30 to 69 feet. This great work is now practically completed, at a cost of Rs. 18,76,000. Nine regulators have been constructed at a cost of Rs. 1,28,020. The head-regulator cost Rs. 62,679; the subsidiary regulators are in the 16th, 40th, 47th, 54th, 60th, 69th, 72nd and 76th miles. The present canal, after passing through Kandiaro and Naushahro, enters the new Nasrat Taluka, which it has transformed from a waterless waste into fertile fields. By means of branches and distributaries the canal commands practically the whole of the Taluka, with the exception of the region of pure sand in the north-eastern corner, and the south-western corner, which is commanded by the Dád Canal. This extensive area, to which for the first time the means of irrigation have been conveyed, has been divided into squares of 16 acres each and is being fast brought under the plough. Owing to the favourable conditions obtaining at its mouth the canal affords an excellent supply, which does not cease till near the middle of November. The average annual cultivation on it for 12 years before the construction of the recent extension was 31,000 acres, whilst the average for the two years 1903-04 and 1904-05 was 68,179 acres, of which nearly three-fourths was irrigated by flow. During the inundation the canal has an average supply of 1,165 cubic feet per second. The duty of water in 1904-05 amounted to 98. The average gross revenue in these two years has been Rs. 1,30,226 and the cost of clearance Rs. 36,870.

NAULAKHI CANAL.

The Naulakhi Canal, on which the greater portion of the Naushahro Taluka depends, has the reputation of being one of the oldest canals in Sahiti, the ancient name of this portion of

the district. It is said to have been constructed prior to the Kalhora dynasty. It draws its supply direct from the river in Kandiaro. In 1883, owing to the original mouth being injured by erosion, a new mouth was constructed in a channel of the river: this having since silted up, the old mouth is again in use. After a short course through Kandiaro the canal traverses the centre of the Naushahro Taluka, supplying water on its way to the orange and mango orchards of Thárushah. A little south of this town, at mile 24, it bifurcates, the two branches being known as the Murád Wah and Peroz Wah, each of which is about 24 miles in length. Both of these branches terminate in the Moro Taluka, but neither carries an adequate supply of water for the cultivation of land at its extremity. The length of the Naulakhi system is 123 miles. The width of the canal at the head is 58 feet and at the bifurcation 30 feet; the high gradient gives the current a velocity which scours the bed and banks, thus reducing the cost of clearance. The banks are occasionally breached and in a high inundation the town of Thárushah is in danger of submersion. The alignment is defective, several sharp bends occurring to impede the flow and enhance the risk of breaching. This canal flows till about the beginning of December. The average discharge is 1150 cubic feet per second and the average cultivation 49,786 acres, of which more than one-third is irrigated by flow. The duty of water is 46. The average gross revenue is Rs. 1,25,143 and the cost of clearance Rs. 17,929. Improvements and extensions of the system involving an outlay of Rs. 13,92,100 have been sanctioned: the main canal is to be straightened, the Murád and Peroz to be extended and improved and two new branches commanding new land to be constructed.

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DAMBHRO CANAL.

The Dambhro Canal, which irrigates portions of Naushahro and Moro, takes off from the river in the Naushahro Taluka. The main canal, which is very crooked, has a length of 31 miles and its numerous small branches are only kept in fair order by a comparatively heavy expenditure on clearance. The length of the whole system is 66 miles. In 1888 a new head 12 miles in length was excavated at a cost, inclusive of that of the head-regulator, of Rs. 27,700. In 1894 another sluice costing Rs. 1,500 was constructed at the mouth of an old channel known as the Begam Dhoro which used to carry away a large quantity of water to waste. These improvements have raised the revenue

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from Rs. 16,860 in 1887-88 to Rs. 28,783 in 1904-05. The average supply is 343 cubic feet per second and the average cultivation 12,420 acres, of which about one-third is irrigated by flow. The average gross revenue has been for the last three years Rs. 29,606 and the cost of clearance Rs. 11,165.

DAD CANAL.

The Dád Canal taps the Indus in Naushahro close to the Moro border. Originally about 33 miles long, it served only the Moro Taluka; but it has now been extended and widened and commands in addition the south-western portion of Nasrat and the eastern border of Sakrand. The length of the main canal is now 96 miles and of the whole system 352 miles. In 1870 a new head 3 miles in length was constructed, opening from a channel of the river: in 1888 the river receded, leaving another channel, but in 1897 returned and carried away the first 8 miles of the canal together with the service bungalow and a fine garden attached to it and the entire village of Mithiáni. The present mouth was excavated in 1898, but its situation in a sand-bank, which has to be cut through every year, is unsatisfactory. Recent improvements, begun in 1898, are now nearly completed and will cost Rs. 27,32,700. They include the widening of the bed from 40 to 81 feet, the construction of three new main branches, having a total length, with their subsidiary branches, of 51 miles, and the improving and supplying of nine branch canals formerly fed by the Ren Wah. They will raise the full discharge from 1,612 to 3,170 cubic feet per second. Five regulators have been constructed at a cost of Rs. 1,56,781. During the 12 years ending 1896-97 the average cultivation was 45,800 acres, of which less than one-third was under flow irrigation. In 1903-04 and 1904-05 the cultivation averaged 71,457 acres, of which nearly half was under flow. The average discharge was 2,341 cubic feet per second indicating a duty of 36. The average gross revenue was Rs. 1,52,851 and the cost of clearance Rs. 57,114.

MINOR RIVER CANALS.

The minor canals of the Northern Hyderabad Canals system are the Bhur, Bhorti, Mir Wah Sahro, Jio and Gháro Alibahar. The united length of these canals is 36 miles and the extent of cultivation they support 10,072 acres, mostly lift. The gross revenue is Rs. 23,256 and the cost of clearance Rs. 8,053.

RIVER EMBANKMENTS.

The only river embankment existing in the Northern Hyderabad Canals District is the Naulákhi Bhorti Band in Naushahro. In the

inundation of 1894 the country between the Naulakhi and Dambhro Canals was submerged and it was to prevent a repetition of this occurrence that the embankment, 5 miles in length, was constructed in 1895 at a cost of Rs. 20,700. In 1897 it was raised and straightened at a cost of Rs. 13,400 and in the following year it was extended by 3 miles at a cost of Rs. 29,600. Since then, in consequence of the attacks of the river upon the original portion, two new loops have been constructed, costing Rs. 50,000.

Northern Hyderabad Canals District.

FINANCIAL RESULTS.

The following table exhibits the financial results of the Northern Hyderabad Canals during the three years ending with 1904-05.

Year.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent. for year.
	Rs.	Rs.	Rs.	
1902-03 ...	34,02,689	3,42,064	77,553	2·28
1903-04 ...	37,73,026	4,70,155	1,77,050	4·69
1904-05 ...	39,45,113	4,52,706	95,390	2·42

CENTRAL HYDERABAD CANALS DISTRICT.

Central Hyderabad Canals District.

The Central Hyderabad Canals District contains 7 large and 4 minor canals, which issue from the river in the Sakrand and Hála Talukas. The total length of main canals is 267 miles and of branches 652 miles. All these canals were in existence before the annexation of the province by the British; but they have been greatly improved and the fact that they have not yet received head-regulators is due to the uncertain behaviour of the Indus in this portion of its course. They are all purely inundation canals, flowing from the end of May till October. They irrigate on an average 2,34,037 acres yearly, of which a little more than one-sixth is under flow. The only works for which a capital account existed were the Alibahar Kacheri, Márakh and Sarfráz Canals, but the account is now closed and all expenditure on repairs and minor improvements is met from revenue. For the other canals revenue accounts only have been kept. The annual gross revenue is Rs. 4,78,878 and the expenditure on account of clearance Rs. 75,378. The system is managed by an Executive Engineer whose headquarters are in Hyderabad.

Central Hyderabad Canals District.

MINOR RIVER CANALS.

The Ghári Fatehpur is a small canal, 7 miles long, which takes off from the river near Dinal in the Sakrand Taluka. A branch, known as the Khán, is 2 miles in length. The Sadarang Wah, 9 miles in length, obtains its supply from the river through the Mehrabpur Dhand in the Sakrand Taluka and tails into the Sakrand Dhand. It has no branches. The Daryakhan Wah issues from a channel of the Indus known as the Gharo Alibahar Kacheri in the Sakrand Taluka. It is 4 miles long and its branch, the Alibahar Lundo, has also a length of 4 miles. The Nur Wah, only 1½ miles in length, takes off directly from the Indus. It is under contemplation to supply these minor canals from the Ren Wah. The recent average of cultivation on them has been 4,296 acres, the gross revenue Rs. 8,855 and the cost of clearance Rs. 1,601.

REN WAH.

The Ren Wah, irrigating the southern portion of Sakrand, draws its supply from the Nasri Dhand, which is filled by the overflow of the river. The length of the main canal is 24 miles and of its three remaining branches 10 miles. It formerly had other branches, which since 1901 have been transferred to the Dád Canal: it carries consequently much surplus water which it is now proposed to utilize for feeding the three minor river-fed canals of the Sakrand Taluka. The annual cultivation is 2,785 acres, of which 751 acres are under flow: the gross revenue is Rs. 6,153 and the cost of clearance Rs. 1,073.

ALIBAHAR KACHERI CANAL.

The Alibahar Kacheri Canal has now for many years been fed from the Nakur Dhand, situated in Sakrand and close to the Hála border, but it is under contemplation now to supply it from the Ren Wah. It irrigates land in the Sakrand, Hála and Shahdádpur Talukas. The length of the main canal is 21 miles and of its branches 32 miles. In 1877 a sum of Rs. 23,207 was spent on improving the Alibahar system. The average annual cultivation in the last 3 years has been 10,291 acres, of which about 662 acres were under flow irrigation: the gross revenue was Rs. 20,932 and the cost of clearance Rs. 3,885.

MARAKH CANAL.

The Márakh Canal issues from the river in Hála just south of the Sakrand border. It traverses Hála and Shahdádpur, splitting up near the town of Shahdádpur into two branches. The left-hand branch, the Sháho Wah, is controlled by a regulator constructed in 1899 at a cost of Rs. 11,000 about a mile below the

Central Hyderabad Canals District.

point of bifurcation, and 6 miles further on it passes under the Jamrao Canal by means of a syphon 9 feet in diameter. It thus extends into the Sinjhoro Taluka of the Thar and Párkar District. Two branches, the Huzur Wah and Bijar Wah, take off below the syphon. Between 1871 and 1882 a sum of Rs. 1,93,600 was expended on widening the Márakh and improving its gradients, with the best results, for the canal is now the finest of the Central Hyderábád Canals. A cut has recently been made from the Márakh to the Gháro Gáhot, a branch of the Gháro Ráno, which has relieved the latter of all its branches, with the exception of the Lakhi Wah, and has added to the Márakh system 7 branches with a total length of 50 miles. The length of the main canal is 23 miles and of its present branches, 25 in number, 218 miles. The average discharge during the inundation is 1,180 cubic feet per second. The cultivation is 54,887 acres, of which about ⅛ is under flow; the gross revenue is Rs. 1,26,786 and the cost of clearance Rs. 15,803.

GHARO MAHMUDO CANAL.

The Gháro Mahmudo Canal is the name of a system comprising three canals, the Gháro Rano, the Gháro Bhánot and the Gháro Mahmudo itself. There existed formerly a channel of the Indus known as the Gháro Wado which parted from the main stream just below the mouth of the Márakh Canal in Hálá, but the continuity of the channel being subsequently destroyed by the river cutting into it, the disconnected channels became known by the names mentioned, and now act as feeders to important canals. The northernmost is the Gháro Ráno, which is 12 miles long and has at present one branch, the Lakhi Wah, which is 9 miles long. The Gháro Bhánot, the middle section, is 8 miles long and has two branches having a combined length of 28 miles. The Gháro Mahmudo itself is 16 miles long and supplies two large canals, the Alibahar Tando Adam and the Sángro. The former has a length of 15 miles, while the Sángro is 47 miles long and its five branches have a combined length of 36 miles. The total length of the system is thus 221 miles. The Sángro crosses the West Branch of the Jamrao Canal by means of a syphon 8 feet in diameter and extends into the Mírpur Khas Taluka of the Thar and Párkar District. A regulator controls the volume of water entering the syphon. The cultivation, which is situated in the Hála, Shahdadpur, Tando Allahyar and Mírpur Khas Talukas, now averages 64,979 acres, of which 7,745 acres are under flow

Central Hyderabad Canals District.

irrigation; the gross revenue is Rs. 1,28,240 and the cost of clearance Rs. 22,283.

GHALU CANAL.

The Ghalu Canal draws its main supply direct from the river, the mouth being situated in a bend about 12 miles south of the town of Hála, but also receives the surplus water of the Gháro Mahmudo, which tails into it near Khebar. A branch of the Ghalu, known as the Mir Wah, crosses the West Branch of the Jamráo Canal near Mir Wah Gorcháni by a syphon 8 feet in diameter and irrigates land in the Mírpur Khas Taluka of the Thar and Párkar District. A regulator controls the canal just above the syphon. The main canal is 37 miles long and its 13 branches have a combined length of 121 miles. The most important branches are the Bhumphar (21 miles), the Nangnai (21 miles) and the Mir Wah (17 miles). The average cultivation is 35,742 acres, of which 1,659 acres are under flow: the gross revenue is Rs. 66,586 and the cost of clearance Rs. 7,023. The average discharge is 647 cubic feet per second, which gives a duty of 85.

NASIR WAH.

The Nasir Wah takes off from the Indus just below the Ghalu in Hála. Owing to constant changes in the river the canal has had several mouths, traces of which are still in existence. The latest mouth, through which it now receives an excellent supply, was excavated in 1897. The canal is 26 miles long and has 14 branches with a combined length of 100 miles. The cultivation, which is situated in the Hála, Tando Allahyar and Dero Mohbat Talukas, averages 33,834 acres, of which 759 acres are under flow, producing a gross revenue of Rs. 74,756. The cost of clearance is Rs. 14,987. The canal has an average discharge of 376 cubic feet per second.

SARFRAZ CANAL.

The Sarfráz Canal draws its supply from the river near Matiári and irrigates land in the Hála, Hyderabad, Tando Allahyar, Dero Mohbat and Tando Bago Talukas. This canal has been worked under serious disadvantages. In 1872 a diversion, involving a diversion of the Khesáno, a branch of the Nasir, was required to be made at a cost of Rs. 1,18,500 in consequence of an obstruction caused by drift sand. In 1892 an embankment costing nearly Rs. 9,800 was constructed at the head of the canal to protect it from floods which were silting up the mouth. During the last three years erosion has been going on at the head, causing it to

silt up and thus obstructing the flow before the end of the season. A new head was therefore excavated in 1905 at a cost of R. 19,000. In 1900 a diversion of the tail of the canal 12 miles in length was necessitated by the construction of the Jamráo Canal. A regulator has been built at the tail of the diversion. The length of the Sarfráz is now 80 miles and its 6 branches have a combined length of 30 miles. The average discharge is 399 cubic feet per second. The average cultivation is 27,344 acres, of which 2,626 acres are under flow, producing a gross revenue of 46,569. The average cost of clearance is Rs. 8,772.

Central Hyderabad Canals District.

RIVER EMBANKMENTS.

The only river embankment in the Central Hyderabad Canals District is known as the Ghalu Alibahar Band. This, which extends from the mouth of the Alibahar Tando Adam, a branch of the Gháro Mahmudo, to the high ground at the mouth of the Sher Wah, a private canal, is $5\frac{1}{4}$ miles long and was constructed in 1894-95 at a cost of Rs. 8,900 to prevent the spill water of the Gháro Mahmudo from flooding the Hála Taluka. In attaining this object the work has been entirely successful.

FINANCIAL RESULTS.

The following table exhibits the financial results of the Central Hyderabad Canals during the three years ending with 1904-05.

Year.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent. for year.
	Rs.	Rs.	Rs.	
1902-03 ...	3,64,343	4,27,157	2,14,637	58·91
1903-04 ...	3,64,343	4,53,462	2,08,943	57·35
1904-05 ...	3,64,343	4,60,906	1,98,301	54·43

Fuleli Canals District.

Fuleli Canals District.

The canals under the management of the Executive Engineer Fuleli Canals, who has its headquarters at Hyderabad, are the Fuleli Canal, the Hassanáli Canal, the Mulchand Wah and 7 minor river canals. The total length of these canals and their branches is 1,253 miles and the extent of cultivation which they annually support 332,109 acres. The only works for which a capital account is kept are the Fuleli and Hassanáli Canals.

Fuleli Canals District.

The Fuleli is the largest and most profitable canal in the district. Strictly speaking the name should be applied to the upper portion of the canal from its mouth to the Gája Wah, a distance of 25 miles from the Jámshora regulator, the lower portion being locally known as the Guni; but officially the whole stream is now referred to as the Fuleli.

In 1836 the Fuleli was nothing more than a channel utilized by the river in the inundation. On the annexation of the Province the British found the canal in a neglected condition : there was no control, water entered late and ceased to flow early in the season, while in the low lying Taluka of Badin the water spread itself out at will so that for two-thirds of the year the country was submerged and the small quantity of rice grown was reaped and collected on rafts of straw and grass. In 1857 the head of the canal was improved by removing sand-bars, widening contracted portions and excavating the channel to a regular gradient at a cost of Rs. 20,000. In 1858 a new supply channel nearly 5 miles long was cut from the river at Jámshora to the Fuleli at Hyderábád and completed in 1861 at a cost of Rs. 1,05,300. From its original mouth to Hyderábád the canal pursues a tortuous course originally 18 miles in length but now reduced to 16 miles. The new cut is not only much shorter, but has a lower level and is able to draw water from the Indus throughout the year. The width of the new channel was originally 40 feet, but in 1869 it was increased to 65 feet and it has been further increased by the action of scouring to 90 feet. The position of the mouth at Jámshora was well chosen : the old canal was much affected by the constant changes in the river, but at Jámshora the river has shown no sign of change and an excellent supply is always obtained. Since 1858 various works have been carried out for the improvement of the main channel of the Fuleli and many regulators constructed.

In 1900 a channel known as the Fuleli Escape was constructed from the triple sluice at mile 81, where the canal proper ends, to the Dhoro Purán, a distance of 17 miles. This work, which was completed in four years, cost Rs. 1,98,800 and is, next to the new mouth, the greatest improvement effected in the canal.

The Fuleli is now a perennial canal with a full discharge, measured at Hyderábád, of 11,000 cubic feet per second. The average discharge during the inundation is 5,750 cubic feet and during the *rabi* season 1,700 cubic feet per second. The

gradient is 6 inches per mile and the velocity of the current during the inundation $3\frac{1}{2}$ feet per second, or nearly $2\frac{1}{2}$ miles per hour, which is sufficient to keep the main channel free from silt. The breadth of the canal at Hyderábád below the junction of the two channels is 200 feet and the depth of water at full supply 23 feet. The canal is navigable for country craft and steam launches throughout the year. The following are the principal branches of the Fuleli.

Fuleli Canals District.

Name and situation.	Length in miles.	Remarks.
Canals *ex* old Fuleli.		
1. Kamál Wah in 3rd mile L. B. with 2 branches ...	20	Regulated.
2. Imám Wah Khokhar in 9th mile L. B. with branch...	38	
3. Nur Wah in 9th mile L. B. with 5 branches	33	Regulated.
4. Sind Wah in 9th mile L. B. with 5 branches	23	
5. Imám Wah Husri at mile 9 L. B. with 7 branches ...	29	Regulated.
Canal *ex* new Channel.		
6. Wádhu Wah at mouth R. B. with 5 branches... ...	20	Regulated.
Canals *ex* Fuleli below Junction.		
7. Dhadhro Wah in 20th* mile L. B. with branch ...	28	
8. Gája Wah at mile 25 R. B. with extension and 2 branches.	60	Regulated.
9. Pándhi Wah in 30th mile R. B. with 6 branches ...	28	Regulated.
10. Imám Wah in 35th mile R. B.	32	A Jagirdar's canal.
11. Alibahar Wah in 36th mile L. B.	20	
12. Sháh Wah in 45th mile R. B.	19	Regulated.
13. Imám Wah Janobi in 46th mile L. B. with branch ...	34	
14. Mulchand Wah at mile 46 L. B.	25	Regulated.
15. Mir Wah in 58th mile R. B. with 2 branches	68	Regulated. Below Badin the canal is called Ghári Mandhar.
16. Nasir Wah in 60th mile L. B. with diversion, new cut and distributary.	54	Regulated.
17. Mánik Wah in 63rd mile L. B. with 3 branches ...	46	Regulated.
18. Shádi Wah in 70th mile L. B. with 3 branches ...	50	Regulated.
19. Kázia Wah in 76th mile R. B.	45	Regulated.
20. Alibahar Káro in 77th mile L. B.	20	Regulated.
21. Ghár Kadhan in 80th mile R. B. with 3 branches ...	19	Regulated.
22. Sanhi Guni at mile 81 R. B. with 2 branches ...	45	Regulated.
23. Fuleli Escape at mile 81 with 2 distributaries at mile 10.	29	Regulated. The Escape itself is 17 miles long.
24. Ali Wah at mile 81 with branch	27	Regulated.
25. Sher Wah at mile 81	24	Regulated.

* The distances are reckoned from the head-regulator at Jámshora.

Fuleli Canals District.

Many of the larger branches, such as the Imám Wah in Guni, the Imám Wah Janobi in Dero Mohbat, the Mulchand, Nasir Wah and Shádi Wah in Tando Bago and the Mir Wah and Kázia Wah in Badin, are navigable for country craft for considerable distances.

Old Fuleli	16
Fuleli	81
Branches	971
Total	1,068

The total length of the system is 1,068 miles. The average cultivation is 3,03,512 acres, of which about two-thirds is under flow irrigation. The average supply maintained throughout the year works out to a duty of 48. The average annual revenue is Rs. 6,94,613 and the annual cost of clearance Rs. 97,493.

Minor River Canals.

HASSANALI CANAL.

The Hassanali was originally a comparatively small canal, but was entirely re-made in 1903. It now runs in a straight line from the old mouth near Kátiár in the Gúni Taluka to the Gájáwáh, an effluent of the Fuleli. The Gájáwáh has been blocked at its 24th mile, and while the upper portion continues to draw its supply from the Fuleli, the lower portion, 18 miles, is now fed by the Hassanali, which name it bears. The total length of the main canal is now 35 miles and its branches have a combined length of 63 miles. The average discharge in 1904-05 was 489 cusecs and the duty 32. The average annual cultivation is 11,259 acres, of which nearly ⅘ths are under flow: the gross revenue is Rs. 28,825 and the cost of clearance Rs. 4,908.

KHAIRWAH.

The Khairwah, which issues from the river near Kátiár in the Guni Taluka, was constructed by the Tálpurs and is 14 miles in length, discharging into the Dhadhkowah. The average cultivation is 2,096 acres. The gross revenue is Rs. 5,245 and the cost of clearance Rs. 1,982.

DHADHKOWAH

The Dhadhkowah issues from the Indus at about 3 miles from Jerruck in the Guni Taluka and has a length of 14 miles. It discharged formerly into the Gájáwáh, when its length was 18 miles, but since the construction of the new Hassanali Canal it has been reduced. It dates from the Tálpur period. The total cultivation is 1,634 acres, the gross revenue Rs. 2,766 and the cost of clearance Rs. 870.

MULCHAND CANAL.

The Múlchandwah, which is said to have been excavated by Munshi Múlchand in the reign of Mir Nasir Khan Tálpur, takes off from the river one mile below the Dhadhkowah and forms the lower portion of the western boundary of the Gúni Taluka. This

canal, which is 18 miles in length, irrigates land in the Gúni Taluka of Hyderábád and the Mirpur Bathoro Taluka of Karáchi. The gross revenue is Rs. 19,761 and the cost of clearance Rs. 6,735.

Minor River Canals.

Besides these there are 5 petty canals, the Chandan, 2 miles long, Mírwah, 3 miles, Wásingwah, $1\frac{3}{4}$ miles, Núrwah, $1\frac{3}{4}$ miles, and Khokharwah, 5 miles, which irrigate 5,994 acres of land and yield an average annual revenue of Rs. 18,424, the cost of clearance being Rs. 4,734.

RIVER EMBANKMENTS.

Ghallian Band. During the abnormally high inundation of 1894 the river overflowed its banks between the Old and New Fuleli and flooded a large tract of country down to the Káthri road. To protect this tract the "Ghallian Band", $6\frac{1}{2}$ miles in length, was constructed in 1895-96 at a cost of Rs. 22,649.

Jámshora Band. The construction of this embankment, which is 9 miles in length, was necessitated by the occurrence of a spill in the year 1892-93 which caused great damage to the buildings and roads in the Doábo to the southwest of the Hyderábád Town and Cantonment, and also to the Hyderábád-Umarkot Railway. The expenditure incurred amounted to Rs. 12,516. It was subsequently strengthened at a cost of Rs. 6,505. In 1897 the river threatened a portion of it and a loop was therefore made behind it at a cost of Rs. 6,252 and again in 1900-01 a new *band* called the New Jámshora Band was constructed along the right bank of the Wádhuwah down to the sandhills at a cost of Rs. 16,559.

Gidu Bandar Band. This *band* protects the Mir's Tando and also some Government buildings in the neighbourhood of Hyderábád. It was taken over by Government in 1894-95 and was raised and strengthened at a cost of Rs. 8,993, and a sum of Rs. 22,334 was subsequently spent in pitching it and providing a loop *band* behind it.

Malh Band. This is 2 miles in length and extends from the end of the Gidu Bandar Band to the foot of the Ganja Takar hill. It was constructed in 1895-96 to protect the Mir's Tando, the safety of which was endangered in 1894. The expenditure amounted to Rs. 3,170.

Hájipur Band. This is one of the oldest river *bands* and was

Minor River Canals.

constructed during the days of the Mirs. It was thoroughly repaired and strengthened in the year 1879-80, at a cost of Rs. 19,712, and in 1895-96 it was extended southward as far as the Dhadhkowah at a cost of Rs. 4,000. Since that over Rs. 1,14,000 have been spent on loops to this *band*, where erosion was threatened, and on other works connected with it. Its total length, from the foot of the Ganja Takar hill to the Budka Takar opposite to Jerruck, is 16·26 miles. The *band* abutted there on the sandhills, which were eroded in the high inundation of the current year (1906), and the river overflooded its bank there and caused a large breach, which flooded a tract of country about 1,000 square miles in extent in the Guni and Játi Talukas down to the sea.

FINANCIAL RESULTS.

The following table exhibits the financial results of the Fuleli Canals during the three years ending with 1904-05.

Year.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent for year.
	Rs.	Rs.	Rs.	
1902-03 ...	18,69,919	6,52,130	3,03,901	16·25
1903-04 ...	19,94,737	8,16,122	4,37,255	21·92
1904-05 ...	21,15,545	7,31,010	3,43,301	16·23

JAMRAO CANALS DISTRICT.

Jamrao Canals District.

The Jamráo Canal issues from the Eastern Nára at mile 100 near the junction of the boundaries of Khairpur, Hyderábád and Thar and Párkar. The suitability of the spot for the head of a large canal which should irrigate the lands lying along the badly watered boundary of the Hyderábád and Thar and Párkar Districts was first noticed in 1857 by Mr. Barnes of the Sind Irrigation Department. At that time works had already been constructed with a view to preventing the flood waters, which occasionally passed down the Nára valley, from being absorbed in the large depressions on either side, by confining them within limits and thus conducting them to the fertile alluvial lands south of Mithráo. The Nára Supply Channel was in process of excavation, but the Mithráo Canal, the first of the Eastern Nára Canals, had only recently been sanctioned and the late General (then Captain) Fife, R. E., who was Superintendent of Canals, brought

the Jamráo Canal project before Government in 1860 more to prevent it from being lost sight of than with any wish to press the immediate execution of the work. In fact the Jamráo scheme was subordinated to a much more ambitious project involving the construction of a large canal from Rohri to Hyderabad, and remained in abeyance till 1872, when it was taken up afresh by Colonel John Le Mesurier, R. E., with the warm support of the Commissioner, Sir William Merewether, who had the opportunity of bringing the project personally to the notice of the Viceroy, Lord Northbrook. A formal survey was then entrusted to Major Smith, R. E., whose project, submitted in 1876, formed the basis for that which was eventually sanctioned; but, though supported by Sir William Merewether, it failed to obtain sanction at that time. Representations made in 1891 by Mr. R. B. Joyner, Executive Engineer, Hyderabad Canals, in favour of the greater scheme above mentioned led to the appointment of the Sind Irrigation Commission, which, however, decided finally on the Jamráo and preparation of a revised plan was entrusted to Mr. J. Tate. The plans drawn up by Mr. Tate, which involved an expenditure of 72 lakhs of rupees, were sanctioned by the Secretary of State in May 1894. Work was commenced in the following November and the canal was opened by Lord Sandhurst on November 24th 1899.

Jamrao Canals District.

The head-works are particularly fine and costly and consist of a weir 1,250 feet long, a massive head-regulator of 6 arched openings having each a span of 25 feet, a series of 7 scouring sluices, each of 25 feet span, at right angles to the head-regulator and in line with the weir, training banks strongly pitched with brickwork up and down-stream of the head-regulator and of the further or eastern end of the weir, to confine and guide flood waters, a series of protective embankments and buildings for the establishment. The main canal is 117 miles in length and has a bed width at the head of 125 feet, which is reduced gradually to 33 feet at the tail. It is furnished with regulators at intervals of about 10 miles to assist in the distribution of the water. For the first 7¼ miles the depth of water at full supply level is 8 feet; the canal then descends over masonry falls, the depth of which as designed was 7·87 feet but is now much less owing to the accumulation of silt. From the foot of the falls the depth of water is 10 feet, which is gradually reduced to 4 feet at the tail.

Jamrao Canals District.

In its 39th mile the canal passes over the Sháho Wah, a large branch of the Márakh Canal, which is carried under the Jamráo by an inverted iron syphon 9 feet in diameter. Escapes have been provided at the 84th and 118th miles, both leading into the Dhoro Purán. The canal bifurcates in the 56th mile. The smaller channel, known as the West Branch, is aligned to the west of the Dhoro Purán, whilst the main channel lies to the east of the Dhoro. The West Branch is 63 miles in length and is provided with regulators at intervals, like the main canal. Inverted masonry syphons carry the Sángro Wah and Mir Wah under it in its 18th and 27th miles. It is provided with an escape in its 32nd mile and another at the tail, the water from which reaches the Dhoro Purán eventually.

The gradient of the main canal is 9½ inches per mile in the first 7½ miles, and after that from 5 to 6½.

The maximum discharge is 3,200 cubic feet per second. During the inundation the average supply is 2,610 cubic feet per second and in the *rabi* season 2,335 cubic feet. The latter curiously is considerably larger than the *rabi* supply admitted into the Nára Supply Channel; the excess must come from numerous *sangs* or natural reservoirs situated on the long course of the Nára through the desert. The duty of water during the *kharif* season is 66 and during the *rabi* 42.

The distribution of water is provided for by a system of minor canals, which take off at selected points above the regulators. The supply in each is controlled by a sluice or regulator where the canal leaves the parent stream. The minor canals are also each furnished with the necessary number of regulators. Distributaries, which serve the same purpose as minor canals, but are much smaller, have been added where necessary to enable the system of village watercourses to be carried out over the whole area. The total length of the Jamráo system, excluding village watercourses, is given in the margin. The headquarters of the Executive Engineer, Jamráo Canal, are at Mirpur Khas. In addition to the usual staff he is provided with Canal Assistants and Abdárs, whose sole duty it is to watch the management of water in the vilages and to report any breach

	Miles.
Main Canal	117
West Branch	63
Minors and Distributaries ...	406
Total ...	586

of rotation or other offence against the irrigation rules. The power to punish such offences is vested in the Executive Engineer, an appeal lying to the Colonization Officer. The village watercourses have been constructed by the Irrigation Department and are aligned to command the land which they serve to the best advantage. The canal officers watch the management of water not only in the main canal, minors and distributaries, but also in the very fields themselves. By this means rotation is enforced and the people are enabled to cultivate a larger area than would be possible were they left to themselves. The clearance and repair of the village watercourses devolve on the owners, that is the landholders.

Jamrao Canals District.

For ten miles the Jamráo flows through a region of sand-hills before it emerges into culturable land. The main canal irrigates the Talukas of Sinjhoro, Mirpur Khás and Jamesabad of the Thar and Párkar District, whilst the West Branch irrigates a portion of Mirpur Khás and the whole of the Digri Mahal in the Hyderabad District. The following is a list of the principal minor canals.

MINORS *ex* MAIN CANAL.

		Length in miles.
1.	Jám Sahib at mile 7 with Ahmedabad branch ...	17
2.	Dim at mile 17 with Rawatiani branch and old Dim Wah	46
3.	Dalor at mile 46	24
4.	Patoi at mile 46	17
5.	Dosu Dahraro at mile 65 with part of old Dosu Wah.	15
6.	Mirpur at mile 65 with parts of old Leth Wah, Piru Wah and Kahu Wah	18
7.	Bareji at mile 78	16
8.	Dengan at mile 84 with distributary...	21
9.	Puran at mile 84 wsth distributary	36
10.	Juriasar at mile 95	21
11.	Duleri at mile 95 with distributary	12
12.	Silor at mile 113 with distributary	15
13.	Bagi at mile 117	10

MINORS *ex* WEST BRANCH.

14.	Bhitáro at mile 7 with parts of old Ranwak Wah and Leth Wah	19
15.	Lahkaki at mile 7 with part of old Káhu Wah ...	11
16.	Digri at mile 32	18
17.	Murid at mile 42 with distributary	18
	Total ...	334

Jamrao Canals District.

The Jamráo is a perennial canal in the fullest sense of the word, but it is not adapted to navigation. It not only contains water throughout the year, save when it is closed for clearance and repair, but its supply can be maintained at a uniform level. Thus land which receives flow irrigation in the *kharif* enjoys the same advantage in the *rabi* season. Indeed the *rabi* supply is the better of the two, since the area of cultivation is less; owing however to the reduced demand for water in the *rabi* season the full supply is only admitted during that period in alternate weeks. The canal used to be closed for repair and clearance for 5 or 6 weeks from April 1st, but in 1905 it was not closed in order that foreign varieties of cotton might be grown.

The *rabi* cultivation on the Jamráo amounts to about one half of the *kharif*. Taking both *kharif* and *rabi* together, about two-thirds of the irrigation is by flow. The following table exhibits the cultivation on the Jamráo Canal and the revenue derived therefrom:—

Year.	Cultivation.	Land revenue including water cess and cotton cess
	Acres.	Rs.
1902-03	2,63,490	7,95,999
1903-04	2,86,051	8,03,937
1904-05	2,65,262	7,87,876
Average	2,72,267	7,95,937

The area supplied by the Jamráo has been divided into 463 villages or dehs, of which 393 are in the Thar and Párkar and 70 in the Hyderabad District. Each village has one or more water-courses from a minor canal, or distributary, or in a few cases direct from the canal itself. The outlets are designed to pass only a definite quantity of water sufficient for the culturable area of the village, and are capable of being increased or reduced in size according to requirements. The total area commanded by the canal is 8,70,850 acres, or nearly 1,361 square miles, of which the culturable area is 7,85,465 acres, more than one-third of which

Jamrao Canals District.

was annually cultivated during the three years ending with 1904-05. Throughout the Jamráo area the powers of a Collector both under the Bombay Land Revenue Code and Bombay Act III of 1899 are entrusted for the present to a special officer called the Colonization Officer.

Two-thirds of the Jamráo tract is surveyed according to the square system adopted from the Punjab. The villages are divided into squares of 16 acres, except where they are broken by roads, village-sites and similar obstacles to symmetry. The squares are demarcated by stones upon which are printed their numbers. Each occupant is bound to surround his square with a *bano,* or raised earthen ridge, and to subdivide it by similar ridges into petty numbers of one acre each. The latter are the units of assessment. Each square receives water from a definite watercourse and may not take it from any other.

In the unsquared area the system is the same as that which obtains in other parts of the Province, though each survey number is only permitted to obtain water from a particular watercourse and at a particular spot, as in the squared area. This regulation is necessary for the purposes of rotation.

Rotation is generally enforced both in *kharif* and *rabi*, especially in the latter. It is only by means of a fair distribution, which cannot be effected except by rotation, that sufficient water can be supplied to all. But despite these arrangements the practice of over-watering is almost universal and the cultivation is generally speaking poor. The three chief crops are cotton, wheat and *bájri*, but the quality is inferior owing to over-watering and lack of manure. The yield of cotton is high owing to the length of time for which water can be given. The conditions on the Jamráo are favourable for the growth of foreign cotton, for the introduction of which measures are being adopted. Rice cultivation is not permitted on the Jamráo.

In consequence of the increased supply of water made available in the Jamráo tract at the cost of Government, a water rate varying from 2 annas to Re. 1-8 per acre is levied under section 55 of the Bombay Land Revenue Code. The water supply being now uniform throughont this tract, the extra rate has been imposed in such a manner as to neutralize the inequalities of the existing assessments pending the introduction of revised settle-

Jamrao Canals District.

ments. With new assessments the necessity for the water rate will disappear. A rate is also levied on all cotton watered after October 31st; the amount is 10 annas per acre for flow and 8 annas for lift irrigation. This rate also disappears with the introduction of revised assessments.

Panjábis	1,272
Other foreigners ...	156
Junior Talpurs ...	57
Military pensioners ...	79
Total ...	1,564

The survey of the area irrigated by the Jamráo was begun in 1898 and completed in 1900. Colonization was commenced in 1901 and in 1905 was still continuing. The number and description of colonists settled on the Jamráo up to July 31st 1905 are stated in the margin. The Panjábis are mostly small land-holders from the Jalandar, Gurdáspur and Amritsar Districts; the other foreign colonists comprise people from Rajputana and Cutch. The area of land held on the Jamráo under the Bombay Land Revenue Code is 3,02,266 acres: the rest is held under Bombay Act III of 1899 in the manner stated in the margin. These tenures are described in Chapter IX.

	Number.	Area (acres.)
Capitalists' grants ...	199	26,213
Yeoman grants ...	1,252	149,348
Peasant grants ...	1,342	55,875
Total ...	2,793	231,436

The following table exhibits the financial results of the Jamráo Canal during the three years ending with 1904-05.

Year.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent. for year.
	Rs.	Rs.	Rs.	
1902-03 ...	83,07,240	5,57,713	3,14,980	3·79
1903-04 ...	84,62,523	6,69,396	4,30,617	5·09
1904-05 ...	82,59,134	6,74,196	3,17,883	3·85

Eastern Nara Canals District.

Eastern Nara Canals District.

The Irrigation District known as the Eastern Nára Canals comprises the Eastern Nára, the Mithráo Canal, the Heran Wah, the Khipro Canal, the Thar Canal and the Hiral Wah, and is managed by an Executive Engineer whose headquarters are at Hyderábád. The aggregate length of the Eastern Nára Canals is 370 miles and of their branches 132 miles; the total annual

cultivation is 275,873 acres, of which 84 per cent. is under flow irrigation.

Eastern Nara Canals District.

EASTERN NARA.

The Eastern Nára is commonly spoken of as a natural branch of the Indus, though it does not appear ever to have been so in the ordinary sense of the term. The upper part of the river, as it existed before works were undertaken by the British Government, was simply a channel, or narrow valley, in the sand hills, through which spill water from the left bank of the Indus above Rohri found its way to the desert. Below Mithráo there was a distinct channel through the alluvial plain to the sea, but this channel could be traced westwards to its source from an ancient course of the Indus upon which Alor stood. There is little doubt however that the Eastern Nára marks the course of the Hákro, or Lost River of Sind, which at some period subsequent to the Arab conquest abandoned its ancient bed and poured its flood into the Chenáb or Indus.* Upon Sir Bartle Frere's advice a survey of the valley was undertaken in 1852 and it was discovered that more spill water escaped from the Indus to the Eastern Nára than had previously been believed, but that, owing to the sandy nature of the valley and especially to numerous immense hollows in the desert, the water, except when a very large flood occurred, was entirely absorbed. Dams were immediately constructed which diverted the stream from the sandy hollows in which it was absorbed to the alluvial plain extending south from Mithráo. The effect was magical. In three years the revenue rose from Rs. 8,000 to Rs. 81,000, but after that the flooding of the plain became gradually less productive as the water sometimes did not dry up soon enough to admit of cultivation. Also, the pasturage being valuable, the people did not wish to plough the whole and the result was a growth of coarse grass and jungle, the latter so dense in places that it was difficult to penetrate by daylight and impossible at night.

In May 1859 the Nára Supply Channel from the Indus at Rohri was opened. This was a cutting 12 miles long, leading from the river to the Eastern Nára. It cost about 5 lakhs of rupees. It was designed to discharge 8,413 cubic feet of water per second during the inundation, and in order to prevent

*The subject is exhaustively treated in Major Raverty's paper 'The Mihran of Sind and its Tributaries' published in the Journal of the Royal Asiatic Society of Bengal, Vol. LXI, Part I.

Eastern Nara Canals District.

enlargement by scouring and the consequent abstraction of too large a volume of water from the Indus, the channel was cut into a spur of the low range of limestone hills which crosses this part of the Indus valley. In addition to feeding the Eastern Nára the channel also supplies water for a small area of cultivation in the Sukkur District and Khairpur State. In 1885 the channel was deepened by 2½ feet and slight alterations effected in the head regulator at a cost of 1½ lakhs of rupees. In 1894 further improvements were made in connection with the Jamráo Canal. These consisted in lowering the bed by 3½ feet more and rebuilding the head-regulator at a total cost of Rs. 2,97,163. The regulator has now 13 spans of 11 feet, provided with iron gates and teakwood needles. The bed width of the Channel at the regulator is 150 feet and its full supply depth 23 feet. It is lined with stone pitching and requires no clearance. The present supply admitted into the channel is 13,000 cubic feet per second during the inundation, from April 1st to September 30th, and 2,000 cubic feet per second during the rest of the year. The maximum discharge, measured on July 14th, 1905, with the upstream gauge on the head-regulator showing 23 feet 4 inches and the down-stream gauge showing 19 feet 1 inch, was 22,000 cubic feet per second. The channel would abstract a still larger supply were it not regulated at the head. The capital expenditure on the Eastern Nára Supply Channel to 1904-05 was Rs. 9,32,957. Though described here, this Channel is included in the Shikárpur Canals District.

The Eastern Nára is now a perennial steam and navigable throughout its length. Including the Supply Channel, which is 12 miles long, its total length from Rohri to the point where it discharges into the Dhoro Purán is 276 miles, but the stream is only maintained for the purposes of irrigation for 216 miles, to the weir below the head of the Thar Canal near the Dhoro Náro Station on the Jodhpur Hyderábád Railway. In addition to the regulator at the head of the Supply Channel, three regulators have been provided, namely a weir at the head of the Jamráo Canal in mile 100, a regulator at Makhi in mile 136, and a weir below the head of the Thar Canal at mile 216. Flood water from the river north of Rohri occasionally passes into the Nára valley;

Kharif lift	11,019
Kharif flow	10,797
Rabi lift	1,321
Rabi flow	12,302
Total...	33,328

Eastern Nara Canals District.

the last occasion was in September 1897, when a discharge of 65,000 cubic feet of water per second was measured in the Nára at the Jamráo head. The average cultivation for the 3 years ending 1904-05 was 35,500 acres, of which the details are shown in the margin. The capital expenditure to 1904-05 was Rs. 9,91,960; the average revenue Rs. 54,791 and the cost of clearance Rs. 6,655.

MITHRAO CANAL.

The benefit of this increased supply in the Eastern Nára was not felt until the construction of the Mithráo Canal enabled the water to be properly distributed for irrigational puposes. The history of the Mithráo is interesting as an instance of a canal constructed through a desert plain where there was no labour available on the spot, where water even for drinking purposes was difficult to procure and where, when the canal had been constructed, there was but a small resident population. A commencement of work was sanctioned in 1857-58, but, owing to the financial embarrassment of the period and the reduction of the Canal Department, construction proceeded slowly. It was practically completed as an irrigation work in 1879. It takes off at the 136th mile of the Nára from the Makhi Dhand, a natural depression embanked as a reservoir, and discharges into the Kháro Kun, a lateral off-shoot of the Nára.

The main canal, which traverses the Talukas of Sánghar, Khipro and Pithoro, is 93 miles long. The bed width at the mouth is 80 feet and the average discharge is during the inundation 2,325 cubic feet and through the rabi season 1021 cubic feet per second. The canal affords a perennial supply. It has eight regulators, one at the head and others at the 3rd, 9th, 30th, 45th, 60th, 79th and 89th miles. There are 9 branches, all regulated, with a combined length of 62 miles; they are the Right and Left Branches at the 9th mile, the Old Dosu Wah, the New Dosu Wah and the Hingorno Wah in the 29th mile, the Atna Wah at the 38th mile, the Dengan Wah at the 42nd mile, the Sámaro Branch at the 57th mile and the Darelo Branch at the 79th mile. The average cultivation for the three years ending 1904-05 was 150811 acres, of which the details are shown in the margin. The capital expenditure to 1904-05 was Rs. 18,79,848 and the average revenue Rs. 3,76,349

Kharif lift	...	13,875
Kharif flow	...	1,01,289
Rabi lift	...	4,439
Rabi flow	...	31,208
Total		1,50,811

Eastern Nara Canals District.

and the cost of clearance Rs. 18,009. The duty is 50 acres in the *kharif* and 40 in the *rabi*.

HERAN CANAL.

The Heran Canal, completed in 1860, takes off from the Heran Tarai, a natural depression connected with the Makhi Dhand. It is not perennial, ceasing to flow in December. It is about 3 miles long and after passing through the Jalab Band, where it is controlled by a regulator, discharges into six private water-courses. The average cultivation is 1952 acres, of which 820 are irrigated by flow. The capital expenditure to 1904-05 was Rs. 3,183, the average revenue Rs. 4,519 and the annual cost of clearance Rs. 42.

KHIPRO CANAL.

The Khipro Canal is a small canal, 15 miles long, which takes off from the Nára at the 184th mile near the town of Khipro. It flows till about the end of November. The first eight miles were constructed is 1871 and the rest in 1891. The canal has two regulators, one at the head and the other at the tail. The average cultivation is 3523 acres, of which one third is irrigated by flow. The capital expenditure to 1904-05 was Rs. 46,893, the average revenue Rs. 5,139 and the cost of clearance Rs. 473.

THAR CANAL.

The Thar Canal, finished in 1867, takes off from the Nára just above the weir in the 216th mile and thus obtains a perennial supply, but it is annually closed on the 1st of December to avoid water-logging. The bed width at the head is 34 feet and the *kharif* discharge in 1904 was 1175 cubic feet per second, the duty of water amounting to 50 acres per foot. The canal, which irrigates land in the Umarkot Taluka, is 24 miles long and has 5 branches, all regulated, with a total length of 48 miles. They are the Right Branch at the 2nd mile, the Chhor Wah at the 3rd mile, the Umarkot Branch at the 7th mile, the Khejrari Branch at the 13th mile and the Nur Wah at the 6th mile of the Khejrari Branch. The average cultivation is 56532 acres, of which the details are shown in the margin. The capital expenditure to 1904-05 was Rs. 7,66,015, the average revenue Rs. 1,27,729 and the cost of clearance Rs. 8,792.

Kharif lift	...	5,041
Kharif flow	...	43,957
Rabi lift	...	66
Rabi flow	...	7,468
Total		56,532

HIRAL CANAL.

The Hiral Canal, completed in May 1903, leaves the Nára immediately opposite the mouth of the Thar Canal, and thus obtains, along with the latter, a perennial supply. It irrigates

Eastern Nara Canals District.

the Pithoro Taluka, is 19 miles long and has 6 branches, all regulated, with a total length of 22 miles. These are the Goradi and Kapuraro at the 5th mile, the Boilo and Ahur at the 8th mile and the Kangni and Kandiaro at the 14th mile. The bed width at the head is 16 feet and the average *kharif* discharge in 1904-05 was 201 cubic feet per second, whilst the *rabi* discharge was 154, the former doing a duty of 100 acres and the latter of 80. The canal discharges into the Nára. The average cultivation is 27551 acres, of which the details are given in the margin. The capital expenditure to 1904-05 was Rs. 2,18,054, the average revenue Rs. 47,949 and the cost of clearance Rs. 1,296.

Kharif lift	...	3,083
Kharif flow	...	12,809
Rabi life	...	2,060
Rabi flow	...	9,599
Total		27551

PROTECTIVE EMBANKMENTS.

Numerous and costly embankments have been constructed with the object of retaining within the Nára channel the increased supply derived from the improvements effected in the upper portion of the river and of protecting from disaster, which might be occasioned by a spill of the Indus above Rohri pouring uncontrolled into the Nára valley, the cultivated lands south of the Makhi Dhand.

The embankments designed to confine the waters of the Nára commence at the 100th mile, where the Jamráo Canal leaves it. Thus the right bank of the Nára is protected by the Old Rata Band, 7 miles in length from the Jamráo head, and its extension, also 7 miles in length, which extends from the end of the older embankment to the Makhi Dhand. Between 1854 and 1858 most of the depressions on the left flank of the Nára between Jamráo and the head of the Thar Canal were embanked.

For the protection of cultivation the Jalab Band, which runs from the regulator at Bakhora for a distance of 12 miles to the westward, was completed in 1873, and a continuation, called the Bakhora Bakar Band, in 1893. The Mithráo is further protected by two embankments starting at the 9th mile. The right flank embankment runs due west for 9 miles, whilst the left flank embankment, completed in 1890 at a cost of Rs. 6,14,542, runs parallel to the canal for 84 miles. The cultivation on the Thar Canal is protected by an embankment which, starting from the head of the canal, runs due south on the left flank of the Nára for a distance of 33 miles. On the right bank of the Nára the

Eastern Nara Canals District.

Bhaiti Band runs from Khipro to the head of the Thar Canal, a distance of 13 miles, whilst an extension, known as the Bhaiti Band Extension, runs from the head of the Thar Canal for a distance of 18 miles southwards. This embankment was commenced as a famine relief in 1900 and was completed subsequently.

FINANCIAL RESULTS.

The following table exhibits the financial results of the Eastern Nára Canals during the three years ending with 1904-05.

Year.	Capital expenditure to end of year.	Gross revenue for year.	Net revenue for year.	Net return per cent. for year.
	Rs.	Rs.	Rs.	
1902-03 ...	63,95,139	5,56,455	4,33,250	6·77
1903-04 ...	65,27,126	5,62,699	4,45,162	6·82
1904-05 ...	66,02,930	5,81,467	4,13,055	6·26

CHAPTER VII.

ECONOMIC.

Tables XI and XII.

The rent of agricultural land is generally paid in produce, cash rents being taken only on land in which *mahsúli* crops are grown, *i. e.*, those which are not susceptible of easy division, such as sugarcane, tobacco, cotton and vegetables. The produce rents fixed by custom vary with the character of the irrigation which the situation of the land allows or requires. Where the land lies much above the level of the water irrigation is costly and the rent paid by the cultivator is low, but when the land can be watered without the labour of lifting, rents are higher. It is the landlord's duty to pay the assessment and to clear the channel by which water comes to his land from a Government canal; but, as stated in Chapter IX, he gets a rebate of a portion of the assessment if the channel is unduly long. RENTS.

The prevailing rent for land cultivated by lift is ⅓ of the produce, the tenant supplying the seedcorn and manure. But sometimes the Zamindár supplies one or both and gets one half, or at least two-fifths. These are matters of accommodation and make it difficult to compare the rents obtained in different Districts. Other disturbing elements are the condition of the land, whether it is ready for cultivation or requires clearance, and, in the latter case, whether the Zamindár or the *hári* is to clear it. So far as comparison is possible, it appears that rents are highest in the more fertile parts of the Lárkána, Sukkur and Upper Sind Frontier Districts, where the Zamindar's share is $\frac{2}{5}$ or even $\frac{1}{2}$, though the *hári* provides seed and manure, and lowest in the Talukas about Hyderábád. But such deviations from the general rate are uncommon. Even the tempting advantages offered by some of the new canals and the fact that there is more land waiting for labour than labour waiting for land, do not appear to have materially

diminished the regard paid by both sides to the time-honoured rules of *batai.* Almost equally uniform is the rent of land irrigated without labour, whether *moki, bosi* or *sailábi,* It is one half of the produce when the tenant supplies seed and manure. But there are considerable variations in the Karáchi District, where the conditions are sometimes peculiar. In the *bhal* lands (see Chapter V) of the Sháhbandar and Ghorábári Talukas for example, on which luxuriant crops of rice are raised without even the trouble of ploughing, the landlord's share is $\frac{4}{5}$ or even $\frac{5}{6}$. But he supplies the seed.

Land on which *mahsúli* crops are to be grown is, as has been said, often let for a fixed cash rent. The amount demanded will naturally be based on the estimated value of the landlord's share of the crop if it were divided according to the custom of *batai*; consequently it is as variable as the productiveness of lands, much more so indeed, for other conditions come in, such as proximity to markets. It is as futile therefore to advance any general statement about the rent of land in Sind as about the value of a horse. From statistics furnished by local officers it appears that land is let for sugarcane cultivation at Rs. 4 per acre and at Rs. 60. The latter rate is obtained at Sukkur: across the river at Rohri the maximum is Rs. 20. The rents of vegetable gardens are as various. Cotton is the most equable of the *mahsúli* crops and a general statement may be hazarded that the rent of good cotton land ranges from Rs. 6 to Rs. 15 per acre, the Zamindár paying the assessment. Taking that roughly at Rs. 2-8-0 an acre, a sum ranging from Rs. 4-8-0 to Rs. 12-8-0 remains to him as rent, out of which he must bear the cost of clearing the water channels. This result is worthless, however, for the cost of clearing the water channels is uncertain, while the assessment is probably much under the average on the cheap land and above it on the other. Calculations made in the Hyderábád District seem to justify the conclusion that the return on cultivated land ranges from about Rs. 3 to Rs. 9 per acre *per annum.* The value of an estate at these rates will of course depend on the average annual proportion of its whole area which admits of cultivation.

PRICES.

The earliest record of the prices of agricultural produce is contained in the statements* showing the results of the sales of grain

*The statements will be found in the Sind Papers presented to Parliament in 1854.

collected by the government as land revenue during the first few years of British rule. The statements furnish the maximum, minimum and average rates realised per *kharár*, and the last, converted into rates per maund of 40 *sers**, are reproduced below :—

Description of grain.	1844-45.	1845-46.	1846-47.	January to March 1849.	1849-50.	Average.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Bájri ...	1 10 6	1 3 2	0 14 8	0 14 2	0 14 9	1 1 10
Juári ...	1 11 3	0 12 3	0 12 0	0 9 10	0 11 8	0 14 7
Wheat ...	1 4 4	0 14 7	1 1 4	0 15 4	0 15 3	1 0 7
White rice ...	1 6 1	0 13 3	1 0 1	0 13 2	0 13 4	0 15 7
Red rice ...	1 0 2	0 14 1	0 11 0	0 13 2	0 10 6	0 13 0
Jamba ...	1 10 1	1 10 6	1 15 5	1 6 10	1 6 0	1 7 6
Rape ...	2 2 6	2 1 5	2 5 0	1 7 11	1 4 0	1 11 2
				General	average.	1 2 2

Probably more than one half of the grain in the market was disposed of at these sales and, communications being very imperfect, the government held a quasi-monopoly of the trade and was in fact, as Sir George Clerk afterwards reported, a "Master banyan." Stocks were held back until prices had risen as high as they would go, or else supplied to the Commissariat at arbitrary rates. The figures quoted may therefore be taken as much above real market values even in the large towns. No comparison with remote rural villages is possible.

The figures given for the last 10 years in Table XII are also for large towns and show that prices have more than doubled since the forties. Taking for comparison *bájri*, which is more a staple food than any other, the average rates for the past ten years in the six Districts have been as follows :—

Karachi ...	...	14·4 *sers*	per rupee	=	Rs. 2	12	5	per md.
Hyderábád	...	15·3	„	„ =	„ 2	10	0	„
Sukkur ...	...	19·1	„	„ =	„ 2	1	6	„
Lárkána ...	...	18·0	„	„ =	„ 2	3	6	„
Thar and Párkar	...	14·4	„	„ =	„ 2	12	5	„
Upper Sind Frontier...		18·7	„	„ =	„ 2	2	3	„

*The following equivalents have been taken for the *kharar*:—bajri and juari 24 maunds; wheat 26 maunds; rice, jamba and rape 21 maunds.

The average of the whole is about Rs. 2-7-0 per maund, against Rs. 1-1-10 realised 60 years ago. And it must be remembered that, with the facilities for carriage of produce that now exist, the difference can never be very great between the wholesale prices at the capital and in the fields, while there could scarcely be any relation between the two at a time when there were neither roads nor bridges and a large part of the country was under water for half the year.* The average price of each of the principal grains in each District during the last ten years is given below:—

District.	Average rate per maund for		
	Juari.	Wheat.	Rice.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Karáchi	2 8 3	3 10 9	3 14 9
Hyderábád	2 9 7	3 11 3	4 3 4
Sukkur	1 15 1	3 2 10	3 10 8
Lárkána	2 3 10	3 2 10	3 11 3
Thar and Párkar	2 10 9	3 9 8	†2 15 9
Upper Sind Frontier	2 0 0	3 8 8	4 3 4

WAGES.

Table XII exhibits the average daily wage of skilled and unskilled labour in each District during the ten years ending 1904-05. The figures have been obtained by careful inquiry and may be relied on as fairly correct; but if we wish to compare the earnings of the labourer to-day with those of his father, we must have recourse to the published official reports, and the comparison at once raises a suspicion of their trustworthiness. It is not only that the fluctuations are unaccountable, but that they make it appear that there has been no advance in the price of labour during the last thirty years. If this is correct, then there must have been some peculiar conditions at that time producing artificial rates, and the comparison may as well be dropped. For the

*In 1847 Major Walter Scott wrote "I saw in last December large fields of *kurbee* about 20 miles east of Tatta, from which the people had merely cut the heads and then turned the cattle in to feed upon the leaves; and this at a time when fodder of the coarsest kind was excessively dear at Kurrachee."

† Cheap red variety.

last ten years the daily wage of a common labourer in the head-quarter towns has stood, with little variation, at 4 or 5 annas. This does not mean that he earns Rs. 7-8-0 a month, but that he could do so if he liked. The Sindhi does not work more than he is obliged and he inclines naturally towards a conscientious observance of Fridays and saints days. But a large proportion of the day-labourers are not Sindhis, but men who have come to Sind to make money and do make it. At railway stations and docks such men can often earn 8, or perhaps even 12, annas a day. A skilled labourer, a carpenter or mason, gets a rupee a day, or two annas more or less. Of course these are not rural rates, but rural labour is seldom paid for in cash. The Sindhi, if left to his own devices, has little use for money. When the harvest is gathered, landlord and tenant and farm hands come together, with the carpenter who repaired the water wheel, the potter who made the chatties, the blacksmith who mended the tools and even the old *maulvi* who taught the little boys to read the *koran* ; and each gets his share, large or small, according to the custom which nobody disputes. The village Bania is present also to appropriate each man's share, except the landlord's, in part payment of the food and tobacco with which he has supplied him from week to week during the past season. Labourers who are not regular farm hands may be paid in money, but there are comparatively few such. At times of special pressure, like reaping time, the neighbours come together and help one another. It would be interesting, however, to know what the ordinary earnings of a Sind peasant amount to in cash, and the following is an attempt by a well known native official of wide experience to arrive at an approximation. Taking the area watered by one wheel as 10 acres and the produce at a fair, or rather a good, average as 40 *kásas,* or two thirds of a *kharár* per acre, we get 6 *kharárs* and 40 *kásas,* or say 7 *kharárs,* as the produce of the field, which, at a good price, namely Rs. 40 per *kharár,* comes to Rs. 280. Deducting from this the Government assessment, which may be put as Rs. 20, and dividing the remainder into three equal parts, we get about Rs. 86 for the Zamindár and Rs. 174 for the *háris.* For a field of 10 acres there will probably be four of them, each owning a pair of bullocks, and the share of each will be Rs. 43-8-0. Even a Sindhi peasant, with a family of say three persons, cannot live for a year on this amount; therefore, unless he is able to engage

in *rabi* cultivation also, he must find some other work during the winter and spring, such as road-making or canal clearance, or else he must live on his generous Zamindár. The way to do the last is to get the Zamindár to be his security with the Bania for advances of food which he cannot possibly repay. Among the liabilities which have brought so many Zamindárs to insolvency the bad debts of *háris* often form a heavy item.

Another estimate puts the earnings of a *hári* from the *kharif* crop at Rs. 30 to himself after paying for the keep of his bullocks. But both estimates present too dark a picture unless allowance is made for several circumstances which often qualify them. In the first place the partners in a field may be a father and his son, or sons, so that the earnings of several individuals are combined to support one household. In the second many *háris* own camels, which they give out for hire, or cattle or goats, the produce of which they sell. The keep of these costs almost nothing, for the *hári* has an understood right to graze them on the Zamindár's waste lands. And there is yet another resource of which the fullest advantage is too often taken. Between the ripening of the grain and the final *batai* in December there is a period of three or four months, during which the *hári* has the crop entirely in his power. It is said that during those months the habitual dependence of many *háris* on the Bania is observed to cease almost entirely. It must also be noted that the calculation made above is for a "lift" crop. The profits of a "flow" crop are almost as much greater as the labour required for it is less, for the difference in the assessment is insignificant. The general opinion of those who have the best means of forming one is that Rs. 100 would be a fair guess at the average annual income of an industrious *hári*. This will support in comfort a family of three or four persons, being in fact more than a day labourer in the country can earn.

MATERIAL CONDITION.

It is generally admitted that the peasantry of Sind appear to lead a happy and easy, not to say rather indolent, life. Their condition is worst in the coast Talukas, where a malarious climate and the uncertainties of agriculture dependent on floods continually depress them. On the other hand the peasantry of Upper Sind, where most of the irrigation is by flow, are better off than even those in the Hyderábád District. Upon the whole there is no

doubt that the position of the indigenous farm labourer has improved much since the conquest. His style of living has changed little, except that he eats rather better food and wears more warm clothing, but his ordinary means of livelihood are less precarious and the greatly increased demand for labour in other directions has made him more independent. The extension of peasant proprietorship which has resulted from the present settlement has also opened a door of ambition, of which the industrious and frugal are freely taking advantage. The non-agricultural classes, in the large towns at least, show every outward sign of prosperity. The whole standard of living has risen among the Amils, from whom the clerical establishments of Government offices and mercantile firms are mainly drawn. Tables, chairs and other articles of European furniture have become necessities, the use of tea is general and cigarettes are affected by the young and fashionable. The expectations of a young Amil, as regards salary, are much higher than those of a Brahman of similar attainments in Bombay.

INDEBTEDNESS.

That the great majority of the cultivating classes are in debt goes without saying and does not necessarily imply that they are not well off. For people so constituted that they cannot keep money, or so situated that it is not safe for them to keep it, the best practicable arrangement may be to live always on the anticipated earnings of the future and possess nothing in the present, and this was the *modus vivendi* adopted by the humbler classes throughout India. In Sind they were fortunate in being as a rule attached to a landlord who was debarred by his religion from taking any interest for the advances which his principles and his advantage alike prompted him to give them; and those of them who serve well-to-do Musalman Zamindárs enjoy that advantage still. It is a very general practice for the Zamindár to maintain his *háris* during the working season and to recoup himself at the *batai*. Those who are obliged to seek the help of the village Bania have their earnings reduced by his charges for interest, which range from 18 to 36 per cent, exclusive of subsidiary exactions. An inquiry made in 1901 into the condition of the *háris* in four selected villages in each Taluka in the Nára Valley showed that, out of 1,774 of these men, employed in 67 holdings large and small, there were 811 who were not obliged to borrow, 306 who borrowed from their Zamindárs and 1,157 who borrowed from the village Banias. In less favoured

regions than the Nára Valley the proportion of *háris* able to live without loans would probably be found to be much smaller.

The position of the Zamindár has not improved under British rule. That he should retain his feudal power and patriarchal authority was not to be expected and the British policy was from the beginning directed to encouraging the humbler tillers of the soil to aspire to independence. But it was no part of that policy to reduce the natural leaders of the people to insolvency and force them to part with their ancestral estates. This nevertheless was the almost immediate effect of the introduction of regular British administration. At the time of the conquest the whole of the land in Sind, exclusive of *jagírs,* was either in the possession, or under the protection, of the large Zamindárs designated by Sir E. James "Lords of the Manor." Smaller landlords and even peasant proprietors existed, but acknowledged the rights of the chief lord by payment of *lápo.** This was almost the only arrnngement possible under such a government as then was and in a country in which cultivation depended absolutely on large works of irrigation involving capital and organised labour. The landholders, large and small, were Musalmans like the cultivators under them. The Hindùs in Sind were not of an agricultural class, nor would the position of a Hindu landholder have been tolerable under the Mírs. Therefore, while the Zamindár and the cultivator alike looked to the Bania for money when they needed it, and he fleeced them of as much of the produce of the land as he could, he had no desire for the land itself. But the introduction of our Civil Courts in 1866 changed all that. In the words of Mr. Mountford (Pamphlet on Relations between Debtor and Creditor) "The facilities offered by the Civil Courts for recovery of debt, the enforced sale of land in execution of a decree, the value land had acquired owing to the security of tenure, the admirable opportunities that the Civil law afforded to the stronger intellect for cheating and deluding the weaker intellect, stimulated the money-lender to advance far in excess of what had been his former limit, *viz.* the surplus of the Zamindár's crop." The introduction in the preceding year of the unfortunate "diffused" settlement cruelly assisted him. Under it the Zamindár

*Supposed to be derived by reduplication from *lap,* a handful. It means the two hands full (*Scottice,* a "gowpen") of grain, or anything else, and is a common term for a common claim in business.

had to pay assessment on all the land that he claimed, though the greater part of it might be unirrigated and incapable of yielding any return. Debarred by a very natural sentiment from parting with any part of his paternal acres, he mortgaged the good to pay the demands of Government on the bad and found the Bania only too willing to accommodate him. The matter ended in the transfer of both to the Bania, who promptly resigned the bad and kept the good. The wholesale ruin of the hereditary landholders soon became too serious a matter to be ignored, whether regarded from the standpoint of justice or policy. It was commonly attributed to their extravagance, but this was far from being the whole truth. Their generosity and hospitality are proverbial, but personal extravagance appears to be the exception and not the rule. From inquiries made through the District officers in 1896 Sir E. James deduced the following percentages. Extravagant—23 per cent; Prudent but in debt from causes beyond their control,—59 per cent; Well-to-do,—18 per cent. It is worth noting that in the Upper Sind Frontier District, with its Baluchi landholders, there are only 15 under the first head, but 75 under the second, while in Thar and Párkar, where the Zamindárs are mainly Sodha Rájputs, there are 50 per cent under the first head. As landlords the old Zamindárs are admittedly generous towards their tenants, and as a wheel in the administrative machinery they are almost indispensable, Of the Hindus who supplanted them Sir E. James says, "A small proportion are good and tolerant landlords, wanting however the power and influence over the actual cultivators possessed by their Muhammadan neighbours. The majority are mere rack-renters." The small proportion consists no doubt of men of a better class who have bought land as an investment, and the majority of village Banias. In 1876 the first Sind Encumbered Estates Act was passed with the view of saving Zamindárs paying more than Rs. 300 assessment per annum who were hopelessly encumbered. It remained open to applicants for only six months and the Banias did their best to dissuade Zamindárs from the humiliation of seeking its protection, and though Act XX of 1881 gave another opportunity for six months, only 477 estates were taken charge of and the current of ruin was scarcely checked. In 1896 Sir E. James submitted a very full report to Government on the whole subject, in which the

following significant facts were disclosed :—

1. More than 42 per cent of the arable land in the Province was owned, or held in beneficiarly possession under mortgage, by Hindus.
2. For every acre taken by a Hindu from Government about 3 acres were bought from Musalmans.
3. During the preceding seven years the land parted with by sale, or by mortgage with possession, to Hindus amounted to more than 22 per cent of the whole occupied area : some of this was probably the same land mortgaged twice over.

In the same year the second Sind Encumbered Estates Act (XX of 1896) was passed and a full time Manager was appointed in April of the following year. This Act also was applicable only to estates paying Rs. 300 a year or more as assessment. Up to the end of 1904-05 the number of estates admitted to the protection of it was 712. Of these 168 had been returned to their owners in a solvent condition. The aggregate claims against these estates amounted to Rs. 45,67,566, of which Rs. 32,70,785 were admitted by the landholders. The majority of the estates under liquidation are leased, but some are departmentally managed. The Manager is directly under the Commissioner in Sind and has under him an Assistant and two Deputies. These appointments have been filled by Mukhtyarkars. The cost of these and the subordinate establishment is a charge against the estates under management, and so are the amounts allowed for maintenance to the owners of the estates. The Act of 1896 has been amended in some particulars by Act II of 1906.

Two other enactments, the Agriculturists and Land Improvements Loans Acts of 1884 and 1883 respectively, have greatly assisted the landholders, especially since the Deccan Agriculturists Relief Act was brought into force in Sind in 1901. The effect of the last Act has been to destroy the credit of the agriculturist and, curiously enough, of the Bania also, for he generally owns land now and is ready to take advantage of his position as an agriculturist against the larger capitalist from whom he borrows to carry on his business. The consequent difficulty of obtaining money is maintained by some to have done much injury to agriculture, and it might well have had this effect without the Loans

Acts. The combined effect of them in restraining both extortion and extravagance and relieving the difficulties of the poorer Zamindárs appears to be beyond question. The extent to which advantage has been taken of the two Loans Acts in each District of the Province is shown in Table XI. The reason for the very limited loans for Land Improvement in Thar and Párkar is that much of the cultivation depends on rain and no improvement is practicable. The condition of the Zamindárs has also improved with their own advance in education and general enlightenment. Many of the large estates are well managed and free from debt; but indebtedness, in a greater or less degree, is still the normal condition of the petty landholder.

CREDIT.

Though the greater part of the population lives on borrowed money, money-lending is not often a profession by itself. The rural Bania is first a shop-keeper and then a money-lender and he contrives to make the one business ancillary to the other. He advances to the cultivator everything that he requires on condition that the cultivator parts with his crop to no one but himself. As a seller his rates are high and he charges interest on all credit transactions; but as a buyer they are very low and he demands discount on his purchases. So he takes parings from every transaction and it is impossible to calculate what the poor cultivator really pays for his assistance. The nominal rate of interest is either *paise rupaiyo,* i. e. one pice per rupee per mensem = 18 per cent *per annum*; or *sawái,* or *panjoth,* i. e. 25 per cent for the season; or *take rupaiyo,* i. e. 2 pice per rupee per mensem, which is 36 per cent *per annum.* Much higher rates are demanded in some cases and have been allowed by Civil Courts, and though the Deccan Agriculturists Relief Act has compelled the Bania to reduce his ostensible interest on mortgage transactions to 12 per cent, he has little difficulty in evading the restriction in effect. His accounts are kept in a manner that almost eludes audit and in a language which neither his debtors, nor the judges of the Civil Courts, can read; hence he is free to practise many devices whereby debits are swelled and credits shrunk. The extent and variety of these revealed by the inquiries first held under the Encumbered Estates Act was appalling. All this, be it noted, is applicable only to the petty rural Banias and not to all of them: the absolute integrity of the great Banias of

Shikárpur and Karáchi has always been proverbial. The prevailing rate of interest in transactions between dealers is 6 per cent. Private persons borrowing money on the security of house, or other, property, pay from 9 to 12. Excepting in Karáchi town, where much business is done on European lines, there is scarcely any banking in the ordinary sense of the term. Musalmans will have nothing to do with usury as a rule, and the Hindu merchant who requires more capital than he has of his own receives deposits, repayable on demand, at from 3 to 6 per cent. Remittance and exchange are usually branches of the business of merchants and commercial agents.

INVESTMENT.

The man who has money to invest in Sind, be he Musalman or Bania or pensioned Amil, looks instinctively towards land. Not only is it profitable under the very light assessments now prevailing, but the possession of it imparts consequence. Money is often expended on residences for the use of the owners, but house property is not in demand as an investment for profit. Even in Karáchi most of the bungalows of the Europeans are owned not by Hindus or Musalmans, but by Pársis. Government paper and other securities find still less favour. To many still nothing seems better than the good old way of converting superfluous money into gold and silver ornaments.

CHAPTER VIII.

TRADE AND INDUSTRIES.

Sind is now in communication by rail with all parts of India and with Baluchistan up to the Afghán boundary, or rather, a little beyond it. A passenger from Karáchi can get to Multán (576 miles) in less than 23 hours, on to Lahore (208 miles more) in about 12 hours, and from Lahore to Calcutta (1,264 miles) in 42 hours. He can get to Quetta (538 miles) in 27½ hours, and less than 7 hours more will take him to the Afghán frontier. From Karáchi to Bombay (993 miles) is a journey of 47 hours. Every year sees progress in the expediting of mail trains and the time occupied in all these journeys will be reduced. To Bombay there is an alternative route by sea. Two lines of passenger steamers, the British India Steam Navigation Company's and the Bombay Steam Navigation Company's (Shepherd's) ply regularly between the two ports, the former of which has a weekly mail service each way timed to meet the English mails. The contract time for the voyage is 33 hours. Fine passenger steamers of the Ellerman line leave for England at intervals of less than a month, the distance being less than that from Bombay by 200 miles, and steamers of other lines pass frequently between Karáchi and ports in Europe. Between Karáchi and the Persian Gulf there is a bi-weekly service of mail steamers belonging to the British India Steam Navigation Company. The internal communications of Sind have developed as rapidly and must seem miraculous to those still living who remember the days of the Mírs. These divide themselves naturally under the heads of Road, Rail and Water.

Roads.

In 1851 Sir Bartle Frere found in all Sind "not a mile of bridged or of metalled road, not a masonry bridge of any kind, in fact, not five miles of any cleared road". Roads in truth are not a Sindhi institution. The sandy plain lies before the camel, to go **Roads.**

Roads. whither he listeth. When the inundation came and the camel could not go, it created over all the land waterways for boats or floats of reeds and grass. But there were well recognised routes, by which the traffic between the large towns was carried on in the dry season, avoiding insuperable obstacles. Such were the route from Karáchi to Shikárpur, from Karáchi to Kotri and, by ferry, Hyderábád, from Hyderábád to Tatta and Lakhpat, to Jodhpur, to Multán. Road making began in earnest with Sir Bartle Frere and now a complete network of roads has overspread the length and breadth of the Province. Many of the most important of them are merely tracks still, for nothing more is required. In the Upper Sind Frontier they are commonly covered with river grass that feet and wheels may not sink too deep in the soft dust. In the south they are merely banks of earth raised above the level of the rice-fields. But whatever the character of the track may be, bridges are essential in a country which is reticulated with canals, and these have been built by the hundred. As a somewhat detailed itinerary of each District is given in the B Volume pertaining to it, only the chief trunk roads need be mentioned here.

From Karáchi there are two trunk roads leading eventually to the north of Sind, which meet at Sehwán. One is the old trade route, which passes two miles to the west of Tháno Bula Khán and goes up the valley that separates the Khirthar and Laki Ranges of mountains. Before it reaches Sehwán a branch takes to the left, passes round the south of the Manchhar Lake and so through Johi, Kakar, Mehar, Nasirabad and Ratodero, to Shikarpur. The main road in use now goes north from Sehwán by Dádu to Lárkana, keeping close to the railway line for the most part, and thence to Shikárpur and Jacobábád. The other route from Karáchi takes an eastward direction first to Gháro and Tatta, and then, turning northward, goes by Jerruck to Kotri and thence, by Mánjhand and Laki, to Sehwán. As a regular route to the north this was first made practicable by Sir Bartle Frere's road over the Laki hills. At that time the Indus, which is some miles away now, washed the foot of the precipitous heights, so that travellers had to cross and recross the river in order to get past them.

From Hyderábád, which is connected with the Karachi-Sehwán road by the Kotri Bridge, roads go to Tatta and Lakhpat, to

Jodhpur and to Multan. The first passes by the bridge over the Indus at Gidu Bandar to Kotri, from which place to Tatta it is part of the Karáchi road mentioned above. From Tatta it takes a south-easterly direction and, crossing the Indus by a steam ferry, enters Saidpur and Sujáwal, whence it takes nearly a straight course to Mughulbhín, and from there, through a salt waste, to a musafirkhana built by the Rao of Cutch on the Kori creek. The creek is then crossed in boats and Lakhpat is reached. **Roads.**

The road from Hyderábád to Jodhpur goes by Tando Allahyar, Mirpurkhás and Shádipali to Umarkot. From Umarkot the road lies through the heavy sandhills of the desert to Gadra on the east boundary of Sind, which is 75 miles from Jodhpur.

The road from Hyderábád to Multan goes north over the ferry on the old Fuleli to Matiari and Hála and then, keeping generally within 8 or 10 miles of the river, it passes through Saidábád, Sákránd, Kázi Ahmed, Daulatpur, Moro, Naushahro, Bhiria and Hálani, avoiding Kandiaro. Beyond Hálani it leaves the Hyderábád District and enters Khairpur territory. From Khairpur territory it emerges at Rohri, whence by Pano Akil, Ghotki and Ubáuro it gets to Kamu Shahid and enters the Báháwalpur territory.

TOLLS AND FERRIES.

There are no tolls in Sind. Ferries are of course numerous. The power of declaring what are Public Ferries, establishing new ones and closing old, as also of fixing fares and authorising exemptions, is vested in the Commissioner under Bombay Act II of 1868. Subject to him the Collectors have the control of the ferries in their respective Districts and can lease them for any period not exceeding one year. They also determine the number of boats to be kept up at each ferry, their capacity and equipment (which includes a certain number of *tunba* and *senahiun, i. e.*, gourds and tanned goat skins as life-buoys,) the crew to be maintained the maximum number of passengers and weight of goods to be carried and other matters provided for in the contract form. The lease is sold by auction and the purchaser is entitled to one third of all earnings: the balance goes to the men under him who provide the boats and work them. All proceeds of Public Ferries are credited to the Local Fund of the District in which they are situated. When a Public Ferry plies between two Districts the proceeds are divided in the proportion determined by

Roads. the Commissioner. Before the Indus was bridged at Sukkur and Kotri there were Public Steam Ferries at both places. There is only one now, which plies across the Indus from Machhí's village in the Sujáwal Taluka to the mouth of the Baghár in the Tatta Taluka. This is sold for the year for more than Rs. 10,000. It is known as the Saidpur-Tanka Ferry. The boat ferries over the Indus and canals number in all more than a hundred, besides some of a temporary character. A list of those in each District will be found in the B Volume pertaining to it.

Railways.

Railways.
HISTORY.

It was in December, 1855, that an agreement was entered into by a company (afterwards named the Scinde Railway Company) with the Honourable East India Company's Government for the construction of a line of railway to join the towns of Karáchi and Kotri. The view with which this line was projected is narrated under Trade. The first sod was turned by Sir Bartle Frere, with imposing ceremony, on 29th April, 1858, and the line was opened for traffic on 13th May, 1861.* The track was single and the line was laid on the standard gauge of 5 feet 6 inches. In the meantime (in August, 1857) the Act of Parliament incorporating the "Scinde Railway Company" had been succeeded by another Act which empowered the Company to make and maintain the "Punjab Railway from Multan to Lahore and Amritsar, and to maintain communication between Hyderabad and Multan by means of steam boats." These were the "Indus Steam Flotilla" mentioned under Navigation. So the "Scinde Railway" grew to be the Sind, Punjab and Delhi Railway, and the length of its lines increased from about 105 to 693 miles. Seventeen years passed and a State railway from Kotri to Khánpur, completed in March, 1878, connected the existing lines and superseded the Indus Steam Flotilla. The next step was a line from Ruk on the Kotri-Sukkur section, to Sibi, which was opened in three sections, the 1st in 1880 and the last in 1888. Next year the Lansdowne Bridge, connecting Sukkur

*The first portion of line laid was one connecting Kiamari with the Railway workshops, which swerved from the present main line near the City Station and crossed the creek not far from where the boathouse now stands. It was opened in January, 1859. Another construction line, which can still be plainly traced, ran from the workshops to Ghizri Bandar. By this locomotives and heavy material were taken to Ghizri, whence, by a circuitous water route, they were got up to Kotri.

with Rohri, was opened by H. E. Lord Reay on 27th March. Before this the Sind, Punjab and Delhi Railway had ceased to be. Its contract with Government having expired, it was taken over by the State on 1st January, 1886, and amalgamated with the Punjab Northern, the Indus Valley, and the Sind Pishin Railways in one imperial system under the name of the North-Western Railway. **Railways.**

The line from Sukkur to Kotri was frequently breached, which caused vexatious interruptions of communication with Karachi and the North-west Frontier and dislocated the export trade. On these grounds it was decided to have an alternative line on the left bank of the troublesome river. In 1892 a single track line had been opened from Hyderabad eastward as far as Shádipali, and now a line was started from Rahoki Station on this line, 6¼ miles east of Hyderabad, and carried to Rohri, a distance of 178·54 miles. This was opened for coaching traffic on 15th December 1896 and since the completion of the Kotri bridge it has become the main route to the Punjab, reducing the distance by about 38 miles. That bridge was completed and opened for traffic on 25th May, 1900.

Other additions to the system were the construction of a line 3·06 miles in length from Karachi City to Kiamari, opened on 16th June 1889, the doubling of the same on 30th June 1897, and the doubling of the whole line from Karachi to Kotri, which was completed on 3rd May 1898.

A branch line of the North-Western Railway system from Hyderábád to Badin, a distance of 61¾ miles, was opened for traffic on 15th October 1904. The track is single and on the standard gauge. An extension of this line across or round the Rann of Cutch, to meet the Bombay Baroda and Central Indian Railway at Viramgam, affording through communication without break of gauge from Sind to Bombay, is expected to be undertaken shortly.

The North-Western Railway is controlled in all departments by a Manager, with two Deputies and one Assistant, who has his headquarters at Lahore. There are three departments, which are quite distinct from each other : each has its own controlling head under the Manager. These are the Engineer-in-Chief, with three Deputies, who has his headquarters at Lahore and is responsible for the buildings, roads, bridges &c. ; the Traffic Superintendent, ADMINISTRATION.

Railways. with two Deputies, also at Lahore, who is responsible for the working of the traffic ; and the Locomotive Superintendent, with two Deputies, also at Lahore, who is concerned only with the maintenance of the rolling stock. The whole line is divided into three Districts, each of which has its own Executive Engineer, District Traffic Superintendent and District Locomotive Superintendent, who manage their own departments within their Districts. Sind includes two Districts. One is the Karáchi District, with its headquarters at Karáchi, which extends, by Kotri, to Dádu on the right bank and Pad-Idan on the left bank of the Indus, and includes also the Badin line. The other is the Sukkur District, with Sukkur for its headquarters, which embraces the continuation of the two lines abovementioned from Dádu and Pad-Idan to Rohri, the line from Rohri to Khánpur in the Baháwalpur State, and the line from Ruk station on the Dádu-Kotri branch to Sibi. On the Rohri-Khanpur section Reti is the last Station in Sind.

DESCRIPTION. The country traversed by the line is flat throughout, except at the pass over the Laki Hills, and the only difficulties encountered, either in the construction or working, are those imposed by canals, rivers and floods. These are serious. The Karachi-Kotri section crosses nearly the whole of the drainage of the Kohistán, which involves the necessity of maintaining nearly 200 bridges, including mere culverts but also including large and costly structures like the bridges over the Malír and Báran rivers. In 1861-62, that is, within two years of the completion of the railway, this section of the line was damaged to an extent that cost more than 7 lakhs of rupees to repair. The Malír bridge has been partly washed away repeatedly and has been practically rebuilt more than once. During the cyclone of May 1902 the line was so seriously breached near Dábeji Station that all traffic was stopped for five days. In this section of the line there are at present the following stations. The mileage is reckoned from Kiamari.

	Mileage.		Mileage.
Kiamari... ...	...	Ran Pethani ...	48
Karachi City ...	3	Jungsháhi ...	56
Karachi Cantonment.	5	Braudabad ...	66
Drigh Road ...	12	Jhimpír ...	76
Malir	15	Meting ...	88
Lándhi	17	Bholári ...	101
Pipri	26	Kotri Junction..	108
Dábheji... ...	37		

Railways.

The portion of the line on the left bank of the Indus from Hyderábád passes through country in which there are no streams, nor violent floods, and though there are numerous bridges over canals and watercourses (189 between Kotri and Pad-Idan) they are not often subjected to serious assault. The most important one is that over the Fuleli, which has four spans of 60 feet. The following stations are on this section.

		Distance from Kotri.			Distance from Kotri.
Hyderábád	...	5	Bándhi	...	102
Tando Thoro	...	...	Pad Idan	...	115
Rahoki	...	12	Bhiria Road	...	122
Khatián Road	...	14	Kandiaro Road	...	130
Alláhdino Sand	...	19	Mahrábpur	...	139
Oderolál	...	29	Setharja	...	147
Tando Adam	...	39	Ránipur	...	153
Shahdádpur	...	51	Gambat	...	157
Lundo ...	...	59	Tando Mastikhán ...		166
Sarhari...	...	66	Khairpur Mír's	...	175
Nawáb Sháh	...	77	Begmánji	...	182
Bucheri	...	85	Rohri Junction	...	191
Daur ...	...	93			

The Kotri-Rohri line on the right bank of the Indus, running for a great part of the distance very near to the river, is frequently exposed to danger by its vagaries. The embankments raised for defence against this danger pertain, however, to the Irrigation Department, for the whole country needs protection as much as the railway. Another danger, which it also comes within the function of the Irrigation Department to deal with, is from floods originating at breaches in the Kashmor Band. These are promptly dealt with, and have given little trouble of late. Traversing a copiously irrigated country, this portion of the line has of course a very large number of bridges. Some of them are large: the one over the Aral near Sehwán has 10 spans of 28 feet and that over the Dunsterwah, a mile further on, 14 spans of 28 feet. The

Railways. following stations are on this section.

		Mileage.			Mileage.
Kotri Junction	...	...	Bálishah ...	...	141
Petáro ...	...	13	Radhan ...	...	146
Unerpur ...	...	20	Sihar ...	...	152
Budapur ...	...	25	Bádeh ...	...	158
Gopáng ...	...	35	Dokri ...	...	162
Mánjhand	...	42	Bákrani Road	...	169
Sann ...	...	54	Lárkána ...	...	177
Amri ...	...	67	Mahiota ...	...	183
Laki ...	...	76	Naundero	...	189
Sehwán ...	...	87	Nasrat ...	...	192
Bubak Road	...	95	Madeji Road	...	198
Bhan ...	...	101	Alláhdadani	...	205
Khudábád	...	107	Ruk Junctin	...	211
Dádu ...	...	113	Bágarji ...	...	217
Phulji...	...	122	Sháhpur ...	...	221
Piáro Goth	...	128	Sukkur ...	...	226
Sita Road	...	135	Rohri Junction	...	228

The portion of the line which lies between Rohri and the Masu Wah, a mile to the west of Mírpur Station, passes through very troublesome country, being exposed to heavy floods, especially when the Indus changes its course as it did in 1906 just above Sarhad Station. On that occasion it cut in four miles from its old bed and flowed within a mile of the Railway Station. In this length of 48 miles (excluding the Eastern Nára Supply Channel near Rohri) there are 57 major bridges, with a total waterway of 12,300 feet lineal, almost all in spans of 40 feet; and 32 minor bridges, with a total waterway of 204 feet lineal. In the 8 miles between the Masu Wah and Sarhad Station there is more than a mile of waterway. Beyond the Masu Wah floods used to give much trouble, but the construction of the Minchin Band in Bahávalpur territory has made these a thing of the past. But the multitude of canals and flood channels renders a very large number of bridges necessary in this portion also and some of them

are of large size. The following Stations are upon this line.

Railways.

	Distance from Rohri.
Rohri Junction	...
Mando Dáiro	...
Sángi	11
Pano Akil	19
Mahesar	26
Ghotki	35
Sarhad	42
Mirpur Mathelo	50
Daharki	59
Kobar	...
Reti	70

This line is now being doubled.

The line to Badin is exposed to little danger and has no large bridge. The following are the stations on it.

	Mileage.
Hyderabad	...
Khathar	12
Tando Muhammad Khán ...	22
Mátli	32
Palh	40
Talhár	47
Peeru Lishári	55
Badin	62

THE LANSDOWNE BRIDGE.

Besides the multitude of little bridges referred to above there are the two great bridges that span the Indus. These deserve description. The Lansdowne Bridge crosses the Indus between Sukkur and Rohri, where from 1879 till 1889 the railway traffic was conducted by a steam ferry, which took the wagons over, 8 at a time. The first surveys for the bridge were made between 1872 and 1874. Several years were spent in considering different proposals with respect both to the plan of the bridge and the most suitable point for crossing the river. Finally it was decided to adopt a design prepared by Sir Alexander Rendel on the cantilever principle. Work was commenced at the end of 1883, but was stopped in March 1885, as the iron work for the big span had not arrived. The whole of what was wanted for this great work was not received until September 1887. Then operations were resumed with

Railways.

vigour and the bridge was practically completed by the end of 1888. On 27th March 1889 it was formally opened by His Excellency Lord Reay and named, in honour of the Viceroy, the Lansdowne Bridge. The bridge crosses the channel from Rohri to Bukkur Island by one span, which consists of two anchored cantilevers 310 feet long, with a central girder of 200 feet, making a total of 820 feet. The total weight of the span is 3,300 tons. The erection of this, which was at the time much the largest span of rigid bridges in the world, was a triumph of engineering skill. The iron work was constructed by Messrs. Westwood and Baille of London, while the work in India and the mode of and appliances for erection were designed and supervised by Mr. F. E. Robertson. Mr. M. S. N. Hecquet was in sole executive charge throughout, with Mr. A. D. Hecquet as his Overseer and one Sub-Overseer, Faiz Muhammad.

The other channel on the Sukkur side of the island has three spans of 278, 238 and 94½ feet respectively. They are constructed with ordinary girders on piers founded on rock. The bridge has a roadway on the same level as the rails and a footway on each side. The roadway is formed of steel corrugated triangle with teak scantlings. The approximate cost of the Bridge was as follows:—

Items.	Sukkur. Channel.	Rohri Channel.	Total.
	Rs.	Rs.	Rs.
Approaches and stations	...	...	4,30,000
Foundations	1,60,000	2,76,000	4,36,000
Girder Work	1,99,000	17,01,000	19,00,000
Erection and painting	1,13,000	6,50,000	7,63,000
Flooring railing, &c.	20,000	32,000	52,000
Staff-quarters, workshops, sidings, &c.	...	...	27,000
*Plant from England	...	...	91,000
† Do. from other sources	...	...	2,21,000
Boat Service	...	...	10,000
Contingencies	25,000	37,000	62,000
Grand Total...	...	...	39,92,000
Deduct value of plant in hand...	...	...	1,70,000
Net Total...	...	...	38,22,000

*Principally cranes and rivetting plant; special appliances were debited to erection.

†Of this, Rs. 67,300 was for carriage and repairs to vessels and other machinery.

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The English charges amounted to Rs. 21,42,000. The entrances to the Bridge are protected by four block-houses, costing Rs. 90,000.

THE KOTRI BRIDGE.

The Bridge over the Indus between Kotri and Hyderábád was completed and opened for traffic on 25th May 1900. It has six spans as below:—

1 span 100 feet clear.

5 spans 350 feet clear.

The total length of the bridge is 1,948 feet. It cost including protection works Rs. 23,00,025. The depth of the foundation below low water is 49 to 60 feet. The roadway and footpaths on the Indus Bridge at Kotri are exactly similar to those on the Lansdowne bridge.

RAILWAY WORKS AT KARACHI.

As has been said, two divisions of the North-Western Railway have their head-quarters in Sind, namely at Karáchi and Sukkur. Large works are maintained at these places. The workshops at Karáchi are very extensive and employ 2,000 hands. They include an Erecting and Repairing Shop, a Boiler Repairing Shop, a Carriage and Wagon Building and Repairing Shop, Fitting, Machine and Paint Shops and a Smithy, Brass and Iron Foundries and a Saw-mill. All new stock arriving from England is erected at these works and a large number of wagons are built. The workshops are fully equipped with machine tools and have lately been supplied with a large quantity of pneumatic tools.

The City Station is properly speaking the starting point of the Railway and practically all the business connected with goods traffic is transacted there; but the line extends three miles further to Kiamári, where goods intended for export by sea are for the most part deposited. There also the steamers berthed at the wharf discharge their cargoes directly into railway wagons to be taken to the Customs Import Yard near the City Railway Station. The Cantonment Station, which is 2 miles from the City Station, takes up all the passenger traffic of the Cantonment. It was a comparatively insignificant looking place and was known as the Frere Road Station. The present handsome building was completed in March 1898 at a cost of Rs. 80,000.

WORKS AT SUKKUR.

Sukkur is also provided with large workshops, including a Foundry and Carriage-building Shops. They are situated at Adamsháh,

Railways.

where also the Foreman and European workmen are housed. As many as 2,000 hands are employed there during busy times. The Passenger and Goods Station is a building of no pretensions, but substantial. Expansion in this quarter is restricted by the very limited space available, which cramps the operations in the yard. There is a large Engine Shed near the Station, from which as many as fifty engines are sometimes sent out on one day. Much work goes on at Sukkur in connection with the preparation of ballast and pitching stone for the railway. The stone is obtained from quarries both at Sukkur and Rohri, where a large yard has grown up in a space cleared by blasting the hills and filling up the hollows.

WORKS AT KOTRI.

The remains of the old Indus Steam Flotilla, to be mentioned further on, are kept at Kotri, with other vessels required for operations connected with the Kotri Bridge &c.

TRAFFIC ON THE NORTH-WESTERN RAILWAY.

The following table shows the total number of passengers of all classes and the weight of goods carried for the public both outward and inward at the Railway Stations in Sind during the past five years.

Year.	Passengers.		Goods.	
	Outward.	Inward.	Outward.	Inward.
	No.	No.	Tons.	Tons.
1900	2,269,283	2,276,512	538,608	598,728
1901	2,502,241	2,509,520	607,240	1,127,010
1902	2,463,740	2,465,539	697,701	1,109,682
1903	2,630,194	2,641,942	646,269	1,407,080
1904	2,927,601	2,936,066	837,013	2,079,506

The bulk of the traffic is with the Karachi Port. Food grains (wheat, rice, *juári*, *bájri*, gram and pulse), oil-seeds, cotton, wool, and bone manure are staples which form the chief exports. Coal, coke, piece goods, iron, kerosine oil, and sugar are articles imported into Sind and Punjáb from Karáchi.

JODHPUR HYDERABAD RAILWAY.

From Hyderábád a single track railway on the metre gauge of 3 feet 3⅜ inches runs due eastwards to Jodhpur and Márwár, crossing the Jodhpur frontier at 124 miles from Hyderábád. The

section from Hyderabad to Shádipali, 55 miles, was originally constructed by the British Government on the standard gauge and opened for traffic in August 1892. In the year 1900 a metre gauge line eastwards from Shádipali, constructed by the British Government and meeting the rails from Jodhpur, was opened for traffic, and later in the same year the Hyderábád Shadipali line was converted to the metre gauge. On October 25th, 1901, the management of the whole line was entrusted to the Jodhpur Bikaner Railway. The capital cost of the Sind section, which is officially known as the Jodhpur Hyderábád Railway, stood on December 31st, 1904, at Rs. 39,07,738, or Rs. 31,514 per mile. The actual receipts from traffic on this section, after deducting working expenses, which consume 53 per cent of the gross earnings, are paid to the British Government. The net receipts thus paid for 1903-04 amounted to Rs. 2,86,858, yielding a return of 7·34 per cent. The rolling stock belongs to the Jodhpur Bikaner Railway and is provided on hire. Through goods traffic has not yet attained any great volume, but in the early months of the year there is a fair traffic in wheat and other grains to Karáchi and a traffic in rice and a little iron from Sind and Karáchi. The local traffic is principally in cotton, wheat and rice from the Nára Valley to Karáchi. The stations on this line and their distances from Hyderábád are:— **Railways.**

Tando Thoro	...	2	Jamráo	...	50
Ráhoki ...	...	7	Shádipali	...	55
Tando Jám ...	...	11	Pithoro	...	64
Khesáno ...	...	16	Dhoronaro	...	76
Tando Allahyar	...	23	Chhor	...	89
Bulghai ...	...	33	Jalujochanro	...	105
Mirpur Khas	...	42	Khokhropar	...	119

Waterways.

Waterways.

NAVIGATION OF THE INDUS.

For five years before the British occupation the navigation of the Indus engaged the serious attention of the Bombay Government in consequence of the necessity of using the river for the passage of troops to Multán and Afghanistán; and several officers were deputed to survey it, whose reports have much interest. The cargo boats (*dhundhi*) on the river then appear to have been of the same construction as those in use now, but were of bad materials, because the poor *Muhánas* could not afford the costly teak timber that came from Cutch and were obliged to use local

Waterways.

materials. "The orchard is robbed," says an old report, "and the country for miles round laid under contribution. In the bottom of a single boat, teak, baire, fir, babul and the kureel tree are sometimes seen together and in the same extent of workmanship 673 patches have been counted." In these days fine timber comes from the Punjáb and is employed in all the boat building yards at Sukkur, as described further on.

The first steamer seen on the river is said to have been the "Indus" in 1835. In 1843 two steamers, the "Planet" and "Satellite," took part in the operations connected with the conquest, and after the occupation of the Province had been completed a small flotilla was maintained under the command of an officer of the Indian Navy, with headquarters at Kotri. From 1852 it appears that something like a fortnightly mail service between Karáchi and Multán was maintained with the help of this fleet. In 1859, however, another flotilla was organised to co-operate with the railway then in course of construction between Karáchi and Kotri, and to this the steamers of the Indus navy were handed over on its abolition in 1862, or thereabouts. This flotilla was amalgamated with the railway in 1870 and its management transferred to Lahore. Some of the old steamers still survive at Kotri. Another company, the Oriental Inland Steam Company, which had been started, with a capital of £ 250,000, for the purpose of navigating the principal rivers of India with "steam trains" consisting of trains of barges drawn by powerful steamers, began operations on the Indus in 1858, receiving an annual subsidy from Government of £ 5,000; but it collapsed through mismanagement and its fleet was sold off in 1869. After the connection of Karachi with the Punjáb by rail in 1878 the river lost its importance as a means of communication. It is still much used, however, for the transport of timber, firewood, hay and all sorts of agricultural produce, as are the Fuleli, the Western Nára and other navigable canals. No account is kept anywhere of the volume of this traffic. The boats engaged in it are registered, however, and the average number of them on the Indus during the last five years has been 3,305. The commonest form of boat on the river is the *dhundhi* of which the following excellent description was written in 1838 by Lieutenant Wood of the Indian Navy.

INDUS BOATS.

"Between the sea and Attock two kinds of vessels are in use, the *Zohruk* on the Upper, and the *doondee* upon the Lower Indus.

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In boats belonging to the latter class, a slight difference in the build gives rise to a further classification, and of this description of vessel the *mohána* (boatman) enumerates more than one variety; but before particularising each, a description of the *doondee* is necessary. Her good and bad qualities are shared alike by them all, and the following notice of this boat is, therefore, applicable to every vessel upon the river:—

> The hull, or body of the boat, is formed by the junction of three detached pieces, namely two sides and a bottom, at variance with our ideas of naval architecture: the three parts are first separately completed, and then brought together, as a cabinet-maker does the sides of a box. The junction is thus effected: when each of the three parts that are to form the whole is complete in itself, the sides are carried to the bottom of the boat, and at once secured, by crooked pieces of timber, to the flat future bottom of the *doondee*. To bring the bow and stern up to the corresponding parts of the sides is more difficult, and to effect this many days are necessary. Where the bow and the stern are to rise, the planks are lubricated with a certain composition, which gives them a tendency to curve upwards, and this is further increased by the application of force. The extremes thus risen, a tackle is stretched between them, and by a constant application of the heating mixture, and a daily pull upon the purchase, they rise to the required angle, and are secured to the side, while an advantageous curve is imparted by this process to the planks in the boat's bottom. The bow of the *doondee* is a broad inclined plane, making an angle of about 20° with the surface of the water. The stern is of the same figure, but subtends double the angle." * * * * "The masts are poised upon strong beams resting athwart the gunwales: moving on this fulcrum, their management is easy, and the masts can be lowered down or placed upright at pleasure. The sail is hoisted behind in preference to before the mast."

The *dhundhi* nevertheless, with its square ends, its high stern and low bow and its great curved steering oar, is a quaint and picturesque object. The *dhondho* is merely a smaller version of the *dhundhi*, used by fishermen. The man and his wife manage

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it, while the children and a few tame herons or cormorants, or perhaps a pelican, behave as steerage passengers. The *kauntal* is of similar construction, but has greater breadth of beam and is used at the ferries for transporting men, cattle and camels. From the registers it appears that the average burden of the boats on the river is about 240 or 250 maunds, but vessels of 800 or 900 are not uncommon. The *zohrak*, with its variety the *bagochri*, is a Punjáb craft, which differs from the *dhundhi* a good deal in appearance owing to its bow and stern being rounded instead of forming an angle with the bottom; but there is little essential difference in the plan of construction. They run to a larger size. There are several other names, which may indicate distinctions known to nautical men, but they are laxly and contradictorily used. The commonest of them is *batelo*, which in its proper application belongs to the largest type of sea-going vessel made in India except the Cutch *kotia*.

Under sail none of these boats will lie within 8 or 9 points of the wind; consequently it commonly happens that the only way of going up-stream is by "tracking," *i. e.* by the crew getting out and towing the boat. They get along at about 2 miles an hour, with luck.

The boats on the Indus are unfitted in every respect for the navigation of the sea and their cargoes, if intended for export, are transferred to sea-going vessels at Keti or Sírganda. These two ports are visited by native craft from Karáchi, Cutch and even Zanzibár, but are inaccessible to square-rigged ships and steamers, for which Karáchi is the only port in Sind.

CONSERVANCY OF THE INDUS.

In December 1853 Mr. (Sir Bartle) Frere received a very encouraging reply from Lord Dalhousie to a letter in which he had suggested the construction of a railway from Karáchi to Kotri. Acting at once, as he generally did, he ordered down Lieut. Chapman, a promising young engineer, then engaged on a road over the hills at Laki, to commence a survey for the proposed line. As Mr. Chapman was sailing down the Indus by moon-light, his boat struck something, probably a dead tree washed down till it stuck in the river bottom, and sank. Mr. Chapman and 27 men with him were drowned. This accident drew attention in a very impressive way to one of the most serious dangers of navigation on the Indus and the need for keeping its channels under constant surveillance.

Waterways.

The conservancy of the river properly commenced however with Bombay Act I of 1863, which provided for the registration of vessels and the levy of pilotage fees by an officer called the Conservator and Registrar of of the River Indus, the sums so realised to be expended in removing obstructions from the river and improving its navigation. This department maintained two steamers and two weigh-boats and a pilot establishment at the Hajámro mouth of the river. The fees levied were at the rate of 4 pies per maund of burden, but were increased in the case of steamers to 10 pies a maund from January, 1868. In the year 1901 Government established a Commission for the Indus, in whose hands all matters connected with river conservancy and the maintenance and construction of canal heads and *bands* were placed. The Commission was further established for the purpose of conducting a scientific study of the river. In consists of :—

The Commissioner in Sind ...	... President.
The Superintending Engineer, Indus Left Bank Division. The Superintending Engineer, Indus Right Bank Division. The Engineer and Secretary.	... Members.

The last holds the rank of Superintending Engineer, 3rd Grade, in order to place him on an equality with the other professional members.

The old Conservancy Department has been taken over by the Commission and the Engineer and Secretary also holds the appointment of Conservator and Registrar.

The following staff is at present employed under the Commission.

1 Assistant Engineer and Deputy Conservator, 2 Assistant Engineers, 1 Sub-Engineer and Deputy Conservator and 7 Supervisors, Surveyors, Overseers &c.,

besides the necessary office establishment.

All the above are paid for by Government, but the Conservancy Department is required to pay a contribution to Government of of Rs. 9,600 to compensate for the pay of the Conservator and Deputy Conservators, and Rs. 4,700 as a contribution towards the cost of work carried out by Government.

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In addition to the above the Conservancy employs an Inspector and three Markers and the necessary office staff, for the purpose of Registration of boats, for whom the Conservancy pays directly.

The income and expenditure of the Conservancy Department for the last five years has been :—

	Boat Fees.	Other income.	Total.	Expenditure.
	Rs.	Rs.	Rs.	Rs.
1900-01 ...	17,532	475	18,007	21,274
1901-02 ...	17,213	58	17,271	20,180
1902-03 ...	16,658	54	16,712	35,441*
1903-04 ...	16,920	92	17,012	23,788
1904-05 ...	16,550	343	16,893	19,693
	84,873	1,022	85,895	120,376

The registration of boats is carried out at Sukkur, Kotri and Keti Bandar. The Deputy Conservators also inspect boat tickets while on tour and the Inspector used to make a tour each year from Keti Bandar to the Punjab-Sind Frontier to collect fees. The fees were levied under Act I of 1863 at the rate of 4 pies per maund on the registered maundage of the boat, until 1st April, 1906, from which date they were abolished by the Commissioner in Sind's Notification No. 327, dated 16th March 1906, in honour of the visit to Sind of Their Royal Highnesses the Prince and Princess of Wales.

The Deputy Conservator, Kotri, makes a yearly tour in the Conservancy steamer "Futteh Mubarak" for the purpose of removing dangerous snags from the navigation channels of the river.

The average number of boats registered for the last five years is 3,305, so the average charge for each boat was somewhat over Rs. 5 per annum, the average size of the boats being thus about 240-250 maunds. Many of the boats are much larger than this and maundages of 800-900 are not uncommon.

For carrying out Inspection work and for the purposes of the river discharge and survey work the Commission maintains the

* Due to purchase of steamer "Futteh Mubarak."

following steamers :— Waterways.

		Tons.	Cost Rs.
1.	Inspection Steamer "Ailie" ...	108	1,57,069
2.	Snagging Steamer "Futteh Mubarak" ..	60	51,239
3.	Launch "Madge"	24	54,027
4.	Launch "Maud"	$9\frac{1}{2}$	16,472
5.	Launch "Ethel"	$2\frac{3}{4}$	5,030

In addition to these and for the purpose of clearing river channels where required and keeping open the mouths of the larger canals when silted, a steam dredge of the sand pump variety was obtained from Scotland in 1905-06 at a cost of Rs. 1,80,000. Her dimensions are, Length 125 feet, Beam 32 feet, Draft 3′—6″, and her working capacity 250 cubic yards solid material per hour. She is fitted for stern or side delivery. For the purpose of repairs to the Commission steamers a Floating Dock at Kotri has been purchased from the North-Western Railway at a cost of Rs. 65,000.

PILOTAGE.

In 1898 the control of the pilotage establishment was transferred from the Conservancy department to the Port Officer of Karachi and shortly after (in 1899) the Pilotage Fund was constituted an Excluded Local Fund, which was to be applied to the maintenance of the pilot service and the upkeep of 14 beacons, originally erected by the Marine Survey, which were useful to native craft entering, or seeking shelter in the various mouths of the Indus. The fund was assisted by a contribution from the Indus River District not exceeding half the expenditure per annum. Fees for piloting vessels in or out, at the rate of $1\frac{1}{2}$ annas per ton, were collected by the officer in charge of the Custom House at Keti Bandar, but included in the accounts of the Karachi Port Office. Two pilot boats were at that time maintained, with a staff of 4 pilots, 2 tindals, and 4 lascars, under a Jamadar of Pilots. In the following six years (1899-1900 to 1904-05) the total receipts were Rs. 16,662-8-9 and the expenditure Rs. 18,107-5-11. The fund was moreover in debt to Government for advances to the extent of Rs. 2,000. Expenditure had been reduced in 1904 by the abolition of 1 boat, 2 pilots, 1 tindal and 4 lascars, the Turshian mouth being the only entrance now much used at which they were considered necessary ; but there appeared to be no prospect of the fund becoming solvent, and in the meantime the remaining pilot boat had been nearly destroyed by fire and a number of the

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beacons were reported to have been washed away. In November, 1905, the Port Officer represented the state of matters to the Commissioner and requested that he might be relieved of the control of the fund, as he had no facilities for visiting the beacons or inspecting the establishment. It was accordingly transferred to the Chief Collector of Customs. Only one boat, a hired *dinghi*, is now maintained, with a small, attendent *machwa*, three permanent pilots and four seasonal khalasis. The beacons are being repaired and renewed at the joint cost of the Pilot Fund and the Indus River Commission. The Fund is still in debt to Government, but current expenditure does not exceed income.

POST AND TELEGRAPH.

Post and Telegraph.

POST OFFICE.

It has already been told (page 147) how Sind, under Sir Bartle Frere, set an example to the rest of India in the use of postage stamps. The lesson was taken and, with the introduction of Indian stamps in September 1854, the "Scinde District Dawk" stamp went out of use. The Province is now included in the Sind and Baluchistan Postal Circle, which is under a Deputy Postmaster General, assisted by two Superintendents of Post Offices whose head-quarters are situated at Hyderábád and Quetta respectively. The Superintendent of Post Offices, Sind Division, exercises jurisdiction over the Post Offices situated in the Districts of Hyderábád, Karáchi, Thar and Párkar, Khairpur Native State and the Taluka of Sehwán in the Lárkána District. The rest of the Post Offices in Sind are under the control of the Superintendent of Post Offices, Baluchistan Division. Each of these two Superintendents has a staff of three Inspectors under him, who supervise each a certain number of Post Offices. The Postmaster at Karáchi is a First Class Head Postmaster and exercises the powers of a Superintendent over the town Sub and Branch offices in Karáchi, Manora and Kiamari, as well as over his own office. He is directly under the control of the Deputy Postmaster General, Sind and Baluchistan. The Postmasters at Hyderábád and Sukkur are Second Class Head Postmasters and they are placed directly under the control of the Superintendents, Sind and Baluchistan Divisions respectively.

Besides these three there are 38 Sub and 184 Branch Post Offices in the Province. The Sub-offices are located as follows :— In the Karáchi District ; 6 at Karáchi itself, including Kiámari

and Manorá, one each at Kotri, Mírpur Bathoro, Mírpur Sákro, Tatta and Sujáwal. In the Hyderábád District; two in Hyderábád and one each at Kandiaro, Naushahro, Badín, Digri, Shahdádpur, Hála, Tando Adam, Tando Alláhyar and Tando Muhammad Khan. In the Sukkur District; one each at Adamsháh, Ghotki, Shikárpur and Rohri. In the Lárkána District; one each at Lárkána, Mehar, Sehwán, Rádhan, Ratodero and Dádu. In Thar and Párkar; one each at Mírpur Khás, Umarkot, Shádipalli and Mithi. In the Upper Sind Frontier, one at Jacobabad. In the Khairpur State, in which imperial Post Offices have been established since 1st January 1897 and which enjoys the privilege of using Service postage stamps for its official correspondence; one at Khairpur. The Branch Post offices are distributed among the Districts as follows:—Karáchi 33, Hyderábád 65, Sukkur 18, Lárkána 26, Thar and Párkar 24, Upper Sind Frontier 9 and Khairpur State 9. The Postmasters in charge of sub-offices get from Rs. 20 to Rs. 80 a month, those at branch offices from Rs. 15 to Rs. 30; but many of the branch Post Offices are committed to school masters, station-masters, pound munshis &c., who get an allowance ranging from 2 to 10 rupees a month for the work. Communication with Post Offices away from the Railway is maintained by means of camels or horses and foot runners. The last do not run much, for the average speed to which they attain is only 4 miles an hour. Each man's daily work is about 8 miles. Letter boxes are kept at many villages where there are not Post Offices. These are cleared once a week or so by village postmen, of whom there is one as a rule to each Taluka. Besides collecting and delivering letters and parcels, including value payable parcels, and registering letters, these men sell stamps and quinine, all on a salary of 11 rupees a month. **Post and Telegraphs.**

Savings Bank work was undertaken by the Post Office in Sind in 1882 and has been appreciated, judging by the amounts deposited. POST OFFICE SAVINGS BANK

The following table exhibits the degree in which the public appreciation of the Post Office, in all its departments of usefulness, has advanced in the last 26 years in the Sind-Baluchistan Circle.

Post and Telegraphs.

Separate figures for Sind are not easily obtainable.

	1880-81.	1890-91	1900-01	1905-06.
Number of Post Offices	85	164	222	286
Number of Letter Boxes	29	103	225	360
Number of miles of postal communication.	1,994	2,195	3,853	3,183
Total Number af Postal articles delivered.				
Letters	5,152,731	4,983,893	6,852,325	7,518,296
Postcards	280,764	1,435,779	3,891,349	5,946,658
Packets, (including unregistered newspapers).	55,219	204,271	503,411	729,609
Newspapers, (registered as newspapers).	674,755	719,519	805,737	930,750
Parcels	34,935	42,913	69,793	79,869
	Rs.	Rs.	Rs.	Rs.
Value of Stamps sold to the public...	79,370	2,50,810	2,61,213	7,10,392
Value of money orders issued ...	26,41,047	51,31,980	57,59,110	70,27,514
Total amount of Savings Bank deposits.	...	23,79,759	26,11,688	44,53,450

Note.—These figures are for both the Provinces of Sind and Baluchistan.

The sale of quinine by the Post office was introduced in 1895, and in the ensuing year 20,888 packets were sold. In 1905-06 the sales amounted to 119,907 packets.

FOREIGN MAIL.

The mail to foreign countries by sea is carried from Karáchi by the steamers of the British India Steam Navigation Company under contract. The last contract, which came into force on 1st May 1905, stipulates for :—

1. Direct weekly communication between Bombay and Karáchi both ways, distance 495 knots, speed 15 knots an hour, contract time 33 hours.

2. Weekly communication between Bombay and Karáchi *via* the Coast ports, both ways, by the same route, average speed

Post and Telegraphs.

15 knots an hour, contract time

	Knots.	Hours.	
Between Bombay and Verawal ...	192	21½	Minimum period of stay at each port.--3 hours of day light.
„ Verawal and Porebandar .	65	7¼	
„ Porebandar and Cutch Mándvi	120	13½	
Between Cutch Mándvi and Karáchi.	182	12¼	

3. Weekly communication between Karáchi and Basrah *via* the Persian Gulf Ports, both ways, by the same route, average speed 8 knots an hour, contract time :—

Ports.	Knots.	Hours.	
Karáchi	...	...	Minimum period of stay at ports 3 hours of day light.
Pasni	202	25¼	
Gwadur	68	8½	
Muscat	230	28¾	
Jask	140	17½	
Bandar Abas ...	130	16¼	
Linga	120	15	
Bahrein	245	30½	
Bushire	170	21¼	
Koweit	162	20¼	
Fao and Mahomerah ...	92	11½	
Basrah	55	7	

4. Weekly communication between Karáchi and Basrah *via* the principal Persian Gulf Ports, both ways, by the same route, average speed 13 knots an hour, contract time :—

Ports.	Knots.	Hours.
Karachi	...	...
Muscat	474	36½
Bushire	594	45¾
Fao and Mahomerah ...	142	11
Basrah	55	4¼

INDIAN TELEGRAPH.

Besides the Railway Telegraph, which is at the service of the public at all Railway Stations, the Indian Telegraph Department has offices at all District headquarter stations and a number of other towns, of which the following are not on any railway line :— Manora, Tatta, Hála, Kambar, Thul, Kandhkot, Kashmor and Umarkot. The Telegraph in Sind is under the Superintendent, Sind and Baluchistan Division, who has his headquarters at Karáchi.

Post and Telegraphs.

INDO-EUROPEAN TELEGRAPH.

Karáchi has been the headquarters of the Indo-European Telegraph Department since its beginning in 1862. A cable between Karáchi and Muscat was laid by a company as early as 1860, but that had ceased to work when the Indo-European Telegraph Department, in 1864, laid a Gutta Percha Cable connecting Fao in Turkish Arabia with Cape Monze, from which a land line of 24 miles completed the connection with Karáchi. In 1866 the land line was superseded by a cable. Many changes, additions and renewals have been made since that time. The present cable connections with Europe are—

Fao to Bushire—One Cable, Gutta Percha, connecting with the Turkish Government Line to Europe opened for traffic early in 1865.

Bushire to Jask—Two Cables, one Gutta Percha and one India Rubber, (one direct and one through Henjam). These cables connect with two Land Line wires from Bushire to Teheran and from there to Europe with Land Lines of the Indo-European Telegraph Company. One was opened for traffic early in 1865 and the other in 1869.

Jask to Karáchi—One Cable, Gutta Percha, opened for traffic early in 1865.

Henjam Station—Opened for traffic April 1904.

Muscat to Jask—One Cable, Gutta Percha, opened for traffic November 1901.

The present charge for messages to Europe per word is

Via Teheran ...	Rs.	1-14-0
Via Turkey ...	„	1-11-0

The average rate of transmission to Europe *via* Teheran is about 15 words per minute : the rate *via* Turkey cannot be given. The following statement shows how rapidly the traffic by this line is increasing.

Year.	State Messages.	Private Messages.	Press Messages.	Total number of Messages.	Gross Receipts.	Net Revenue.
					Rs.	Rs.
1900-1901 ...	4,716	164,128	1,438	170,257	17,52,375	9,08,718
1901-1902 ...	4,086	155,763	1,229	161,078	18,29,035	9,69,382
1902-1903 ...	2,807	173,964	1,479	178,250	14,87,365	5,89,571
1903-1904 ...	3,610	185,215	881	189,706	16,07,600	6,81,367
1904-1905 ...	2,991	210,886	471	214,348	16,93,602	6,15,923

Post and Telegraphs.

Besides the sub-marine cable there is a land line of two wires, under the same Department, running along the coast from Karáchi to Jask. The first portion, to Gwadur, was completed in 1863, but the connection with Jask was not achieved until 1869. Political obstacles had to be overcome and then the inhospitable nature of the country and the scarcity of fresh water and forage made the laying of the line no easy task.

The extensive offices of the Department at Karachi were built in 1866 at a cost of Rs. 2,05,043. The present staff of the Department is as shown below :—

1 Director-in-Chief. Headquarters, India Office, London.
1 Agent of the Department stationed at Constantinople.
2 Directors, 1 stationed at Karáchi and 1 at Teheran.
1 Engineer and Electrician, stationed at Karáchi.
4 Superintendents.
12 Assistant Superintendents.
4 Inspectors in Persia.
79 General Service Clerks.
36 Local Service Signallers.

One Cable ship, the "Patrick Stewart," is maintained by the Department. The Commander, Officers and Engineers are included in the General Establishment.

TELEPHONES.

Karáchi is the only place in Sind as yet which has a Telephone System. The Bombay Telephone Company has a branch there. All the mercantile houses, public offices, clubs and many private bungalows are now connected and a great deal of business is conducted by this means, which minimises the inconveniences resulting from the great distances which separate the port at Kiamari from the business and residential quarters. Manora is connected with Kiamari by telephone, which crosses the harbour by a submarine cable.

TRADE.

Trade.

HISTORY.

We are accustomed to speak of the marvellous development of the trade of Sind under British rule, but revolution would be a better term than development. It is difficult for us at the present day to realise the aspect which the commercial possibilities of Sind presented to our predecessors sixty years ago. The curious thing is that their views were not smaller but larger than ours.

Trade. Those who think that we are unduly vainglorious about our Province and its port, should acquaint themselves with a little of what was said and written by the pioneers of British commerce in Sind, and they would learn to admire the chastened and moderate tone of her merchants at the present day. We only speak of Karáchi as the natural outlet for the produce of Punjáb and the north of India. They spoke thus;—"Kurrachee is a position of very great importance, whether regarded in a commercial, a political, or a military point of view. In a commercial point of view it may be defined as the gate of Central Asia and is likely to become to India what Liverpool is to England."* The fact is that, before there were any railways in India, a river like the Indus seemed to give to the Province that possessed it an advantage which defied competition. And for many years the Indus had been a main channel of the commerce of Central Asia. But it presented certain serious obstacles. The navigation of its mouths was both difficult and dangerous and its current was so strong that the passage of boats up stream was incredibly slow. Accordingly, as soon as Karáchi became a commercial port (about the middle of the 18th century), a good deal of the trade began to avoid the river and take the land route between Karáchi and Shikárpur. Shikárpur during its subjection to the Afgháns had become by far the greatest commercial city in Sind. Its merchants and bankers had relations with all the principal marts of Central Asia. The *Káfilás* that came down the Bolán pass stopped at Shikárpur, where the stream of commerce divided, one branch going to Sukkur and east, or northward, and the other to Karáchi. Before the British conquest Lieutenant Postans reported that the revenue derived by the Mírs from the trade of Shikárpur amounted to Rs. 54,736. But in Bombay it was supposed that the only obstacle to the flow of the commerce of Asia up and down the Indus was the barbaric narrow-mindedness of the Mirs and accordingly some of our earliest treaties with them were directed to opening up the navigation of the river. Naturally, when it came into our own power, that seemed the great thing to do. Said Sir Charles Napier, "If any civilised man were asked, if you were ruler of Scinde what would you do? His answer would be, I would abolish the tolls on the rivers, make Kurrachee a free port, protect Shikárpur from robbers, make

* The Indus and its Provinces, by J. P. Andrew.

Sukkur a mart for trade &c. on the Indus. I would make a track-way along its banks. I would get steam boats." The idea of steam boats developed into "steam trains," that is, strong tugs towing trains of flats. But the mouths of the Indus proved quite impracticable and were soon abandoned. Our troops and stores either took the road to Tatta, or Kotri, or were conveyed from Kiamari to Ghizri, there put into country boats and taken up the creek to Gháro, whence camels carried them 25 miles further to Tatta. Hence sprang the bold conception of a railway from Karáchi to Kotri. By the cooperation of the two great agencies, a railway and steam boats, the trade of India was destined to be developed. In the meantime Sir Bartle Frere had started his experiment of Fairs. The first was held at Karáchi in December, 1852, and is said to have brought together a great and picturesque crowd of dealers in all manner of wares from all parts of India, Baluchistán, Afghánistán and Persia. They continued to flourish for some years. But all these devices were swept aside forever by the opening of the Indus Valley Railway from Kotri to Khanpur in 1878. At once the Indus ceased to be a channel of commerce and the trade by road withered away. The trade of Shikárpnr is not now considered worth registering and no account is taken of the traffic on the Indus, excepting of the inconsiderable quantity of a few simple commodities which comes down from the Punjáb by water to take rail at Sukkur or Kotri. The commercial heart of Sind, the Punjáb and United Provinces and British Baluchistan is Karáchi, and the North Western and Jodhpur-Bikaner Railways are the arteries and veins. The Maritime and the Rail borne Trade are separately registered at the Karachi Custom House, which publishes annual volumes for sale to the public, exhibiting them under various aspects with much fulness of detail. It is therefore unnecessary to to take up space with statistics here, but a brief sketch of the progress and present extent and character of the trade of Sind may be interesting. **Trade.**

For nearly a century and a half, as has already been said, the port of Karachi has been the gate of foreign commerce not only for Sind, but for a large area of north-west India, Baluchistan and Afghanistan. It belonged for a time to the Khan of Kalat, but was taken from him in 1795 by the Mirs of Sind, who recognised its importance and built a fort on the headland of **MARITIME TRADE.**

Trade.

Manora to protect the entrance to the harbour. They also extended a tolerance and even favour to the Hindu merchants on whom the prosperity of the port depended which was foreign to the general spirit of their rule elsewere. A detailed report of the trade of Karachi in 1838 by Commander Carless of the Indian Navy furnishes some particulars of much interest. The value of the whole trade for that year was estimated at Rs. 21,46,625, the most important items in the list of imports being China and Bengal silks, English broad cloth, common English shawls and cotton piece goods of many kinds, both white and coloured, all brought from Bombay to the aggregate value of Rs. 600,000. Sugar from Bengal, China, Manila, Batavia and Malabar aggregated nearly Rs. 90,000. Pepper (Rs. 48,750), copper (Rs. 54,000), ivory (Rs. 64,000) and English cotton yarn (Rs. 20,000) are other items from Bombay. Guzerat sent cotton valued at Rs. 37,500! From the Persian Gulf the principal imports were dates, pearls and slaves (1,500 of them valued on the average at Rs. 80 a head), who were divided into "Siddees" and "Hubshees." Sometimes a Georgian was brought down, but only on a private order, their price being very high. No grain of any kind appears among the imports, but the exports already include Rs. 67,000 worth of wheat. One of the most valuable items of the export trade was opium, brought from Márwar by Tatta and sent to Damaun on account of the heavy British duty at Bombay. The other exports worth notice are *ghi*, indigo (from Khairpur), madder, wool, raisins and salted fish, with fish-sounds and shark-fins. Of the piece-goods, sugar, pepper and spices, a portion went up to Kandahar and Kabul by Kalat; but Commander Carless estimates the value of this trade at not more than Rs. 150,000.

Such was the trade of Karáchi under the Mirs. The effect of its transfer to British rule may best be told in the opening words of Mr. Dalzell's Report on the Administration of the Customs Department in Sind for the year 1863-64:—"It is now upwards of twenty years since the Province of Sind became an integral portion of the British Empire in the East. At that period the value of its trade was Rs. 12,21,600, in 1847-48, five years thereafter, it rose to Rs. 44,26,000, in five years more to Rs. 80,00,000, in the succeeding five years to Rs. 2,15,92,000; and in the

five years ending with the official year just closed it has reached the enormous total value of Rs. 6,66,28,106." **Trade.**

But the wonderful climax which naturally enough excited Mr. Dalzell's enthusiasm was due to a temporary cause, namely, the American war, which brought such prosperity to cotton growers all over India that Maratha cultivators in the Deccan, who previously had as much as they could do to live, kept fast-trotting bullocks with silver-plated yokes and put silver tires on their wheels. Next year brought down the trade of Karáchi by Rs. 1,41,80,956, and it never recovered its former level until Sind was directly connected with the Punjab by rail in 1878. In 1882-83 the total value of imports and exports (excluding Government stores and treasure) amounted to Rs. 7,07,70,838. In the Customs Report of that year the increase in exports, which exceeded imports by 33 lakhs of rupees, is assigned chiefly to indigo, wheat, other grains and seeds. The following year shows another advance of 110½ lakhs of rupees in the exports of Indian products, chiefly food grains and seeds, which is ascribed to the progress of railways in the direction of cotton, grain and seed producing districts and to the reduction of railway rates. From that time the trade of Karáchi has advanced rapidly with the extension of railway communication and irrigation and the improvement of the harbour. The following figures show the total value of imports and exports (exclusive of Government stores and treasure) for the last five years:—

	1900-01.	1901-02.	1902-03.	1903-04.	1904-05.
	Rs.	Rs.	Rs.	Rs.	Rs.
Imports ...	7,46,96,660	10,80,82,992	9,04,78,856	9,66,02,101	12,48,85,189
Exports ...	6,11,10,447	12,47,84,033	10,24,91,154	15,32,64,219	20,57,89,747
Grand Total. .	13,58,07,107	23,2867,025	19,29,70,010	24,98,66,320	33,06,74,936

These figures include the trade of the sub-ports, Keti and Sirganda, the aggregate value of which was as follows:—

1900-01.	1901-02.	1902-03.	1903-04.	1904-05.
Rs.	Rs.	Rs.	Rs.	Rs.
18,08,912	14,38,050	10,60,644	11,53,051	12,27,229

Trade.

The value of imports from the United Kingdom in 1904-05 was Rs. 5,25,73,969, or two-fifths of the whole, Belgium comes next with Rs. 2,41,06,018 and Austria-Hungary next with Rs. 1,04,78,904; but these figures merely show that the trade came from Antwerp and Trieste, not that the goods were the produce of those countries. Of the exports the United Kingdom took Rs. 10,26,60,835, or almost exactly half, Belgium Rs. 2,32,84,747, Germany Rs. 1,89,74,876, France Rs. 1,57,73,585. The trade with Asia, direct, was valued at only Rs. 58,59,991 in Imports and Rs. 49,87,137, in Exports.

There is another point of view from which a striking picture of the growth both of the port and its commerce may be obtained. Up to 1851 only a single English sailing ship had entered the harbour and there was not another for several years. Small steamers came and went, but until the Suez Canal was opened (in 1869) steamers played but a small part in the commerce of India with Europe. In 1854-55, however, the harbour entrance had been so far improved that ten sailing ships entered, and in 1859 the Collector of Customs reported, with pride, that vessels drawing 19½ feet of water had entered with safety and that as many as 25, ranging from 500 to 1,000 tons, had been "at one and the same time accommodated in the port, all of them swinging to their anchors." In 1863-64 the wonderful year of prosperity, 155 square-rigged ships and steamers, aggregating a tonnage of 74,251, entered the harbour, of which 71 came from foreign ports and 84 from Indian. Of the former 47 flew British colours, 7 French, 6 American (bringing longed-for ice!), 3 Russian and 8 Portuguese. Germany had not looked in yet. The 84 vessels from Indian ports included steamers of the B. I. S. N. Company, which had began to run to Busrah every month or six weeks. Contrast with these the following figures for the past five years—

Total number and tonnage of vessels which entered Karáchi

from Foreign Countries and the Coast. **Trade.**

1900-01.		1901-02.		1902-03.		1903-04.		1904-05.	
Vessels.	Tonnage	Vessels.	Tonnage	Vessels.	Tonnage	Vessels.	Tonnage	Vessels.	Tonnage.
				FOREIGN.					
*225	196,674	*304	348,754	*277	359,446	*342	539,512	*450	790,446
				COASTING.					
†343	341,298	†377	427,622	†390	451,546	†412	520,658	†461	720,485
				TOTAL.					
568	537,972	681	776,376	667	810,992	754	1,060,170	911	1,510,931
* Sailing Ships included in the above.									
108	8,799	123	10,269	86	6,401	61	5,031	60	4,612
†Ditto.		Ditto.							
17	1,563	9	639	12	1,040	12	984	8	599
125	10,362	132	10,908	98	7,441	73	6,015	68	5,211

Of the 450 vessels which entered in 1904-05, 346 were British, 24 Austro-Hungarian, 9 Italian, 6 German, 1 French, 1 Dutch, 1 Danish, 1 Swedish, 1 Norwegian, 1 Portuguese and 59 Arab.

Native craft are not included in this statement. The inter-portal coast traffic is mainly carried on by them; but the coasting steamers are gradually taking away much of their business and their doom is accelerated by the dishonesty of the Tindals, who frequently make away with cargo and pretend that it was jettisoned during a storm. The number and tonnage of the native craft that visited Karáchi, Keti and Sirganda in the last five years is shown below :—

1900-01.		1901-02.		1902-03.		1903-04.		1904-05.	
Vessels.	Tonnage	Vessels.	Tonnage	Vessels-	Tonnage	Vessels.	Tonnage	Vessels.	Tonnage.
				FOREIGN.					
164	12,623	188	15,534	158	13,149	156	12,646	172	13,276
				COASTING.					
1623	64,214	2263	96,658	1545	63,626	1443	59,320	1,706	71,550
1787	76,837	2451	112,192	1703	76,775	1599	71,966	1,878	84,826

Trade.

The following figures show the revenue derived from Customs duties during the last five years, refunds and drawbacks being deducted:—

	1900-01.	1901-02	1902-03.	1903-04.	1904-05.
	Rs.	Rs.	Rs.	Rs.	Rs.
Import duty (exclusive of duty on salt.)	35,49,757	49,69,776	31,65,605	32,33,279	38,99,907
Export duty	1,23,832	2,08,496	1,41,661	1,52,636	1,88,309
Import duty on Salt ...	2,869	3,156	4,076	2,887	3,177
Total...	36,76,458	51,81,428	33,11,342	33,88,802	40,91,393

These figures include the customs revenue of the ports of Keti and Sirganda which was as follows:—

	Rs.	Rs.	Rs.	Rs.	Rs.
Import duty	410	324	269	184	299
Export duty	38,149	44,497	29,614	28,786	44,946
	38,559	44,821	29,883	28,970	45,245

RAIL-BORNE TRADE.

The rail-borne trade of India is registered by dividing the country into certain blocks. Sind contains two of these, namely, Karáchi and the rest of the Province, excluding Karáchi. The trade between these two is classed as Internal and that between them and the rest of India as External. The total value of the External and Internal trade of the Province during the last two years is shown below:—

Description of Trade.	1904-1905.		1905-1906.	
	Quantity.	Value.	Quantity.	Value.
	I. Maunds.	Rs.	I. Maunds.	Rs.
External. Imports... ...	42,934,389	12,74,04,053	22,958,661	8,61,48,076
External. Exports ...	10,766,643	7,58,29,799	17,293,221	9,55,56,492
Total ...	53,701,032	20,32,33,852	40,251,882	18,17,04,568
Local or Internal ...	13,495,608	7,10,07,260	11,834,520	7,21,52,068
Grand Total ...	67,196,640	27,42,41,112	52,086,402	25,38,56,636

The following statement shows the quantities and values of a few principal commodities which came down the river from the Punjáb and took rail for Karáchi or other parts of Sind at Sukkur or Kotri during 1905-06.

Trade.

Articles.	Imported into			
	Karáchi.		Sind.	
	Mds.	Rs.	Mds.	Rs.
Cotton, Raw	49,903	8,59,284	1,587	28,566
Gram and Pulse	59,156	1,58,336	63,394	1,71,255
Wheat	832,551	24,03,649	147,859	3,91,215
Railway Plant and Rolling Stock, and Materials for construction ...	3,057	9,171	66,355	1,99,065
Timber, unwrought	137,833	2,75,666	...	...
Wool, Raw	5,970	1,18,035	...	...

TRADE BY ROAD.

The imports and exports by road into and from Sind and British Baluchistan (which are treated as one) are registered only at a few important places. One is in Sind, namely at Miran, within the Municipal limits of Karáchi, on the Ráj Road from Kalát and Las Bela. Two others are Chaman and Killa Abdulla, where much merchandise from Afghanistan takes rail, and there are others on important roads into Baluchistan. The total value of the Exports and Imports is shown below :—

Names of Countries traded with.	Exports.			Imports.		
	1903-04.	1904-05.	1905-06.	1903-04	1904-05.	1905-06.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Afghanistan.						
Southern and Western Afghanistan (including Kandahar, Herat and Gurmsel).	31,45,372	35,67,780	40,92,506	33,90,367	38,88,592	40,32,855
Northern and Eastern Afghanistan (including Kabul and Ghazni).	500	...	...	850	700	...
Total ...	31,45,872	35,67,780	40,92,506	33,91,217	38,89,292	40,32,855
Baluchistan.						
Kalat Territory	3,40,613	7,59,719	5,83,915	3,53,679	4,87,648	4,74,333
Las Bela Territory	1,21,247	1,70,955	1,88,824	5,44,871	4,89,293	4,75,757
Total ...	4,61,860	9,30,674	7,72,739	8,98,550	9,76,941	9,50,090
Seistan	2,94,128	3,23,214	4,11,338	2,12,226	2,23,098	3,34,782
Grand Total ...	39,01,860	48,21,668	52,76,583	45,01,993	50,89,331	53,17,727

Trade.

CHARACTER AND COURSE OF TRADE.

The exports from Sind to foreign countries always greatly exceed the imports. The former consist of raw produce, the latter of manufactured articles. The produce is most often purchased on the field where it grew by the local Banias and finds its way by various agencies either to Karáchi direct, or to other mercantile centres, like Sukkur, at some of which even the large European firms in Karáchi maintain permanent agencies. At such centres the produce often undergoes the processes of sorting, cleaning, pressing &c. which would otherwise have to be carried out at Karáchi

PRINCIPAL EXPORTS.

The following statement shows the quantity and value of the principal articles exported by sea to foreign countries and coast ports during the 5 years ending 1905-06.

Articles.	1901-1902.					
	To Foreign Countries.		To Coast Ports.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		Rs.		Rs.		Rs.
1. Cotton, Raw ... Cwts.	433,390	1,06,04,583	262,039	63,74,892	695,429	1,69,79,475
2. Indigo ... ... „	6,297	6,32,165	4,774	4,72,900	11,071	11,05,065
3. Rice ... ... „	480,218	25,36,267	699,118	27,46,527	1,179,336	52,82,794
4. Wheat ... ... „	7,173,299	3,18,06,556	1,933,034	97,82,313	9,106,333	4,15,88,869
5. Hides, Raw ... „	21,254	7,80,807	951	32,079	22,205	8,12,886
6. Skins, Raw ... „	30,555	28,29,685	3,089	1,66,038	33,644	29,95,723
7. Do. Dressed etc. „	121	15,860	...	...	121	15,860
8. Lac, Seed ... ... „	1,054	44,240	...	...	1,054	44,240
9. Animal Bones ... Tons.	25,503	12,53,830	63	2,677	25,566	12,56,507
10. Seed, Castor ... Cwts.	13,123	91,200	263	1,171	13,386	92,371
11. Do. Cotton ... „	97	259	108,842	2,50,143	108,939	2,50,402
12. Do. Linseed ... „	79,239	6,35,912	78,192	6,69,868	157,431	13,05,780
13. Do. Rape ... „	3,648,445	2,28,16,673	508,633	27,10,601	4,157,078	2,55,27,274
14. Do. Til, or Gingelly „	428,740	39,99,776	21,641	1,88,227	450,381	41,88,003
15. Foreign Wool, Raw. Lbs.	7,001,474	32,27,071	478,839	1,27,188	7,480,313	33,54,259
16. Indian Wool, Raw...	6,514,634	27,66,221	173,671	37,058	6,688,305	28,03,279

1902-1903.						1903-1904.	
To Foreign Countries.		To Coast Ports.		Total.		To Foreign Countries.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Rs.		Rs.		Rs.		Rs.
610,575	1,45,94,750	178,020	43,43,433	788,595	1,89,38,183	1,026,330	2,78,56,075
1,437	1,33,995	4,554	4,45,035	5,991	5,79,030	2,582	2,41,729
286,633	15,31,148	431,885	20,76,898	718,518	36,08,046	265,940	14,44,375
8,848,234	3,87,09,571	1,395,062	67,69,693	10,243,296	4,54,79,264	17,385,110	7,48,41,747
23,048	8,83,321	758	30,239	23,806	9,13,560	21,770	9,71,047
33,895	27,37,430	5,056	2,74,864	38,951	30,12,294	48,386	37,79,683
919	1,16,370	49	6,085	968	1,22,455	549	63,240
2,343	1,87,085	...	...	2,343	1,87,085	1,723	1,56,155
38,051	19,86,694	30	1,150	38,081	19,87,844	29,078	16,91,838
2,245	12,137	183	1,144	2,428	13,281	25,697	1,21,784
59,454	1,64,322	143,123	3,43,622	202,577	5,07,944	188,394	5,88,539
84,757	7,76,828	32,140	2,89,163	116,897	10,65,991	44,278	3,51,633
522,716	32,88,789	72,046	4,77,955	594,762	37,66,744	775,265	45,87,643
409,730	36,23,440	2,089	17,691	411,819	36,41,131	503,479	46,73,156
5,152,184	23,36,935	117,974	26,013	5,270,158	23,62,948	5,208,863	23,69,461
11,359,479	46,55,390	248,693	48,027	11,608,172	47,03,417	12,991,744	52,27,220

Articles—(*contd.*)	1903-1904—(*contd.*) To Coast Ports. Quantity.	Value.	Total. Quantity.	Value.	1904 To Foreign Countries. Quantity.	Value.	To Coast Ports. Quantity.	Value.
		Rs.		Rs.		Rs.		Rs.
1	234,884	63,00,764	1,261,214	3,41,56,839	698,613	1,89,71,774	297,322	83,96,955
2	4,033	4,11,263	6,615	6,52,992	4,031	3,91,895	2,640	2,68,795
3	636,679	26,76,692	902,619	41,21,067	350,432	18,78,524	787,054	34,87,349
4	734,167	35,07,122	18,119,277	7,83,48,869	28,380,715	11,92,44,927	483,118	23,15,656
5	652	26,701	22,422	9,97,748	29,890	15,70,964	342	16,535
6	5,642	3,09,273	54,028	40,88,956	39,306	27,44,075	7,370	4,05,263
7	920	1,42,600	1,469	2,05,840	1,560	2,00,336	919	1,23,670
8	...	...	1,723	1,56,155	4,048	5,11,060	...	...
9	16	593	29,094	16,92,431	20,941	11,08,581	20	887
10	181	675	25,878	1,22,459	11,674	47,902	1,914	7,772
11	144,023	3,22,104	332,417	9,10,643	1,831	4,083	122,987	3,09,448
12	11,772	90,968	56,050	4,42,601	14,354	86,567	16,750	1,06,690
13	92,185	5,48,721	867,450	51,36,364	2,164,111	1,16,00,907	50,265	3,01,031
14	1,107	8,460	504,586	46,81,616	410,908	33,73,052	8,656	65,008
15	211,090	52,945	5,419,953	24,22,406	5,053,852	25,35,672	191,116	79,785
16	159,039	31,540	13,150,783	52,58,760	16,479,744	76,12,980	242,326	37,309

-1905.		1905-1906.					
Total.		To Foreign Countries.		To Coast Ports.		Total.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Rs.		Rs.		Rs.		Rs.
995,935	2,73,68,729	708,857	1,85,66,783	213,986	61,26,756	922,843	2,46,93,539
6,671	6,60,690	2,463	2,47,155	3,022	3,39,095	5,485	5,86,250
1,137,486	53,65,873	299,957	16,27,679	1,015,696	45,42,700	1,315,653	61,70,379
28,863,833	12,15,60,583	12,956,926	5,83,55,876	1,107,511	54,14,656	14,064,437	6,37,70,532
30,232	15,87,499	48,834	26,87,696	537	23,560	49,371	27,11,256
46,676	31,49,338	59,135	46,08,389	6,098	3,76,403	65,233	49,84,792
2,479	3,24,006	4,185	6,06,512	280	32,300	4,465	6,38,812
4,048	5,11,060	1,558	1,82,130	...	...	1,558	1,82,130
20,961	11,09,468	22,661	12,08,012	921	46,052	23,582	12,54,064
13,588	55,674	27,146	1,22,826	233	1,010	27,379	1,23,836
124,818	3,13,531	64,766	1,81,443	46,709	1,19,488	111,475	3,00,931
31,104	1,93,257	3,206	17,425	10,652	76,665	13,858	94,090
2,214,376	1,19,01,938	1,387,132	82,09,577	173,597	11,11,228	1,560,729	93,20,805
419,564	34,38,060	268,671	24,09,139	2,614	20,413	271,285	24,29,552
5,244,968	26,15,457	4,368,157	22,80,817	4,424	1,100	4,372,581	22,81,917
16,722,070	76,50,289	18,287,329	87,80,584	158,467	34,762	18,445,796	88,15,346

The following two statements show the imports into Sind and British Baluchistán during the same period (1) by rail from other British Provinces and Native States, and (2) by road from Foreign Countries. Sind and British Baluchistán are treated as one in the registration of trade by rail and road.

1.—By Rail.

Articles.	1901-02.		1902-03.		1903-04.		1904-05.		1905-06.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.
Wheat	11,729,716	2,84,00,841	12,350,190	2,87,55,806	24,354,910	5,60,28,656	34,921,991	8,05,23,661	18,655,748	4,72,31,002
Rice	73,838	2,31,117	29,503	1,07,394	50,425	2,47,422	66,265	3,29,485	22,300	1,06,261
Sesame	144,550	8,07,600	173,087	9,41,970	287,047	13,06,388	258,072	12,87,470	81,091	14,67,043
Linseed	187,272	10,59,412	130,982	6,96,568	82,080	3,85,690	38,273	1,52,886	12,101	53,869
Rape and Mustard Seed	3,086,377	1,33,96,966	245,649	10,26,345	179,730	7,12,625	1,271,531	50,73,644	146,065	6,39,724
Other Oil Seeds ...	1,835,219	58,56,420	431,847	13,24,938	962,245	28,85,978	1,439,496	44,20,545	1,858,407	63,79,459
Indigo	8,452	7,15,378	4,275	3,66,289	5,934	5,13,497	6,738	5,88,476	7,414	6,49,353
Hides	15,931	4,14,556	10,830	2,97,427	13,907	3,80,200	23,959	6,80,192	42,535	12,90,582
Skins	29,436	8,78,851	28,149	8,23,332	51,693	14,69,253	35,246	10,36,268	71,133	21,93,497
Cotton	424,513	65,45,660	754,615	1,16,76,468	1,001,853	1,82,59,982	928,998	1,54,98,343	1,087,729	2,01,52,644
Wool	54,071	10,35,069	107,809	20,73,561	107,203	21,45,494	129,747	25,95,946	85,080	16,87,145

2.—By Road.

Wheat	98,358	2,84,445	22,489	68,807	25,980	78,507	14,031	40,699	8,099	25,932
Rice	124	518	3,329	12,439	3,512	13,098	494	1,680	2,405	8,557
Rape and Mustard..	61,791	2,90,506	32,854	1,70,077	23,431	98,043	19,724	77,987	19,870	93,067
Other Oil Seeds ...	9	55	21	136	184	3,638	62	377	95	544
Indigo	...	...	20	2,208	...	...	80	7,815	5	506
Hides...	94	2,168	772	12,538	1,973	49,953	995	28,164	828	27,287
Skins	560	12,530	888	30,527	965	18,062	907	17,508	896	23,647
Wool	99,125	19,36,872	57,311	11,13,837	85,316	17,89,093	100,003	22,34,733	115,850	27,49,144

A comparison of these three statements will give a better understanding of the foreign trade of Sind than the best essay on the subject could impart. By far the most important product that Sind exports is *Wheat*, the trade in which is growing rapidly and will continue to grow with the extension of irrigation in Sind and the Punjáb. But about two-thirds of the quantity exported by sea is imported by rail (from the Punjáb) : the remainder may be

Trade.

put down as the produce of Sind, for the imports by land are insignificant. It is grown chiefly in the Sukkur, Lárkána and Thar and Párkar Districts. The destination of the greater part is England and other European countries. The small quantity shown under exports to Coast Ports goes mostly to Cutch in country craft.

Cotton comes next in importance and of this nearly one half is the produce of the Province, grown in the Hyderábád and Thar and Párkar Districts, largely on the Jamráo Canal. It is bought from the growers and taken first to ginning factories in the district, whence, after ginning, it is despatched by rail to Karáchi in unpressed bales of about 440 lbs. weight. In Karáchi it is prepared for shipment in hydraulic cotton presses. Sind cotton has a very short staple and is accounted the worst cotton grown in India. England will not take it and the whole of it practically is shipped to Hamburg and Antwerp. The Saxon and other German spinners and also those of Austria and Russia mix it with wool, or manufacture rough twill with it.

Oilseeds, if taken in the aggregate, contribute more to the value of the foreign trade of Sind than cotton. They are grown principally in the Hyderábád, Lárkána and Upper Sind Frontier Districts. No appreciable quantity of any of them comes into Sind by road, and though a good deal comes by rail, a comparison of the first and third statements above will show that by far the greater part of the Rapeseed and Til (Sesame, or Gingelly) which is annually exported from Karáchi is grown in Sind. Almost the whole crop of the latter is exported to Europe (Antwerp, Hamburg and Rotterdam) where it is employed in the manufacture of "Pure Lucca Oil." Rape, which is used for lubricating and other purposes, goes to France, Germany and Austria and also to England.

Wool always takes a high place among the exports of Sind and is classed under two heads, Foreign and Indian. But, according to the returns, the whole imports by rail and road together do not amount in some years to the exports by sea of foreign wool alone, while the imports by sea at Karáchi are quite insignificant. It might be inferred that the whole of the "Indian" wool is the produce of Sind. But the merchants of Karáchi despise Sind wool and assert that there is very little trade in it. The price obtainable for it at home is only 5*d.* or 6*d.* per lb., while Punjáb wool

commands from 9*d.* to 11*d.* The fact appears to be that the trade terms for wool do not correspond with its place of origin, but with its quality. There are many qualities of wool in Sind, black, brown and white. A good deal of it, especially of the black, is worked locally into blankets and saddle-bags ; but the rest finds its way to Karáchi. Some of it—no one can say how much—is the wool of the *dumba* sheep and is not distinguishable from the same article imported from Baluchistán. Of this last, nearly 3 lakhs of rupees worth was registered at the Land Customs station near Karáchi in one season and this may be much less than the quantity that finds its way across the frontier at places where there is no registration. In these circumstances it is vain to try to estimate the value of the Sind wool annually sent to Europe, which is probably much greater than is commonly supposed. The best is the brown wool of the Desert sheep, known as "Nara Wool." It is in demand in France. Wool comes into the hands of Karáchi merchants mingled with all the dirt that the sheep carried and has to be washed before it is fit for export.

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Rice appears in greater proportion in the column for exports to Coast Ports. It goes to Cutch.

Indigo is an article of which Sind does not grow enough for its own use, except in the Khairpur State, from which and the Punjáb the export trade is fed.

Of the *Hides* and *Skins* exported from Karáchi the greater part is the produce of Sind. They are collected chiefly at Hyderábád and Sukkur for delivery to the exporting firms. The business is mostly in the hands of Khojás, who obtain the hides from the butchers direct, or through dealers of the *Játia* caste, who have collectors all over the country. The majority of the hides are "dead hides," *i. e.* the hides of cattle that have died naturally. They are removed from the carcasses by *Dheds, Shikáris* and other low castes. Skins (of goats and sheep) are collected through men of the *Kalál* caste. Of course a certain proportion of both hides and skins are tanned, but there is not much foreign demand for Sind leather. Those intended for export are therefore merely cured with salt and afterwards, in the case of hides only, poisoned with arsenic. The hides go to almost every country in Europe, the skins almost exclusively to America. The market rate for ox and cow hides at Karáchi ranges from Rs. 8-8-0 to Rs. 14 per maund

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of 28 lbs. according to quality, for buffalo hides from Rs. 6-8-0 to Rs. 8-12-0 and for buffalo calf skins from Rs. 7 to Rs. 9-10-0. For goat and sheep skins the rate is from Rs. 20 to Rs. 30 per score. Rates fluctuate of course, falling very much in years of drought.

Animal Bones. The bones of large, and small cattle and camels are collected in the same way as hides and sent to Karáchi as they are found. At Karáchi they are put through bone-crushing machines by the exporting firms and shipped to Europe under four denominations, *viz.* (1) Bone-meal, (2) Bone-dust, (3) Crushed Bones and (4) Bone-sinews. The first two are used as manure, the others principally for the manufacture of glue. They go to Antwerp, Hamburg, Liverpool, Marseilles and some other ports. The bones cost something less than Rs. 2 per maund of 42 sers, while in Europe the sinews realise from £ 6 to £ 7 a ton and even the dust as much as £ 3.

LAND TRADE OF THAR AND PARKAR.

There is one section of the export trade, however, which does not come into these statements, nor into any published returns. From the whole of Thar and Párkar and also from the eastern side of the *Lár* there is a regular traffic by land with Márwar, Gujerat and Cutch. The amount cannot be stated, but in good years it is by no means inconsiderable and to the people it is very important, for this is the way in which they dispose of the principal productions of their poor country, which are live cattle, *ghi*, gum, *khatha* (home spun blankets) and embroidered cloths. The goods are carried across the Rann on asses and camels by certain well known routes. Much rice is sent to Cutch in the same way and from Nangar Párkar even *bájri* and other grains.

PRINCIPAL IMPORTS.

The Imports both from foreign countries and from other Indian ports are as many and various as the exports are few and simple. They comprise almost every artificial production from railway materials to patent pills. Railway materials form indeed a very considerable item and so do military and other stores imported by

Government. Of private merchandise the biggest item is and always has been Cotton Piece-Goods. In the days of the Mírs nothing was in greater demand than common English shawls, chintzes and calicoes. Now the total imports from Europe of Grey Goods, White Goods, Muslins, Chadars, Dhoties, Scarves &c. are valued (in 1905-06) at 380 lakhs of rupees, and similar goods of Indian make are obtained from Bombay and other ports to the value of 160 lakhs more. Unbleached cotton cloth constitutes ⅞ths of the latter. After Piece Goods comes Sugar, mostly from Austro-Hungary, but also from Germany, Java, Mauritius and other places. The foreign imports of sugar last year were valued at nearly 18 lakhs of rupees. Manufactures of Steel and Iron, Machinery and Kerosine Oil are other large items. But only a small proportion of it all is Sind trade. Of the Piece Goods imported at Karáchi the railway carried 98 lakhs worth into Sind, but 187 lakhs worth into the Punjáb. It was the same with other commodities, but the quantity actually distributed in Sind cannot be exactly ascertained. The Import trade is not so much in the hands of the great Karáchi firms as the export. Many Native firms in the large towns of the Punjáb and North India have corresponding firms, or clearing agents, at Karáchi and many Karáchi traders and shop-keepers get out goods in their own names. The distributors are mostly Banias in the cloth trade, Borahs in iron, Parsees in spirituous liquors. By the agency of these and under them the village Bania and the pedlar, cheap foreign cloth, such iron tools as the village blacksmith does not make, bowls of enamelled iron and a few other articles that the peasant has a use for, with sugar and kerosine oil, are disseminated through the country. Markets and fairs form an important part of the advertising and disseminating agency.

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FAIRS.

Fairs are almost as numerous in Sind as holy places. Every departed saint has his day, on which the devout come together to worship and buy and sell in his honour. Some of these religious fairs bring together forty or fifty thousand people, some only a few

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hundreds; some last for a week, some only for a day. The following are the most important:—

Where held.	When.	For what time.	Average attendance.	Supposed value and nature of goods annually sold.
		Days.		
Sháh Yakík in Shahbandar ...	First Sunday of *Chet.*	3 or 4	14,000 to 15,000	Rs. 20,000. Gold and silver articles, wearing apparel, metal vessels, fancy articles, sweetmeats and fruit.
Mughulbhin in Játi..	23rd *Phagun.*	6	10,000	Rs. 20,000. Goods of all sorts sold. No animals.
Uderolál in Hála ...	First day of *Chet.*	5	50,000	Rs. 2,50,000. Provisions, sundries, fancy articles, *súsi* cloths and camels.
Badín	5th *Rabi-al-sani.*	15	10,000	Rs. 23,000. Sundries, brass trinkets, silk, Cutch silver-ware and camels.
Bulri in Gúni ...	1st *Zilkad* ...	7	10,000	Rs. 30,000. Sundries, brass trinkets, silk, Cutch silver-ware and camels.
Sehwán	18 *Shahbán*...	3	30,000 to 40,000	Rs. 25,000, Carpets, utensils, cloths, toys, articles of food. No animals.
Pithoro	1st *Bado* ..	4	20,000 to 30,000	Rs. 2,00,000 to Rs. 3,00,000. Silver and brassware, silk, linen goods (*khes* and *susis*) embroidered work, harness and *nats*, toys and fancy articles, sweetmeats, grains and cloth.

CHAMBER OF COMMERCE.

For a long time after the conquest Bombay merchants would have nothing to do with Karáchi except as a port from which the products of Sind, if there were any such, should be sent to Bombay to be bought and shipped to Europe. Sir Bartle Frere wrote scornfully of them "turning up their noses at a commerce of which they have only a huckster's notions." It appears to have been in 1860, or shortly before it, that Bombay firms began to open branches in Karáchi. At any rate, in that year a Karáchi Chamber of Commerce was formed with seven members, namely, Messrs. D. McIver & Co., Messrs. Fleming & Co., Messrs. Finlay & Co., Messrs. Ashburner, Bell & Co. Messrs. Barclay, Watson & Co., Messrs. T. Lidbetter & Co. and Messrs. I. L. Dunolly & Co. Six more joined in the same year, making thirteen. Of these

only one, Messrs. Volkart Brothers, survives to this day. Very soon after its birth the Karáchi Chamber of Commerce caught the Sind spirit and began a persistent agitation for the expansion by every means of the trade of the Province, which had much effect in urging on harbour improvements and railway extensions. The Chamber now has a membership of 45, being an increase of 10 since 1900. Since 1893 the Chairman of the Chamber has always been nominated an additional member of the Bombay Legislative Council. **Trade.**

NATIVE WEIGHTS AND MEASURES.

Native Weights and Measures.

The unit of weight is always a maund (*man*) of 40 *sers* each *ser* weighing 80 *tolas*. For common purposes a ser is considered the equivalent of 2 lbs, but it is actually about $\frac{4}{5}$ of an oz. more and the official equivalent of a standard maund is $82\frac{2}{7}$ lbs. This maund is used in the whole Province and does not vary with the commodities.* The common divisions of the *ser* in use are :—

Duka	=	1 *Tola*	(=The weight of a rupee).
Chatáng	=	5 *Tolás*.	
Adh-Páu	=	10 „	
Páu	=	20 „	
Adh-Ser	=	40 „	(This is called a *Kacha Ser* in Lower Sind).

In Karáchi the *Khandi* (Candy) is also a unit of weight, equal to 8 maunds.

Gold and Silver are weighed by *tolás, másás and ratís*, 8 *ratís* being equal to a *mása* and 12 *másás* to a *tola*. Precious stones are weighed with *ratís*, which are the same as those used in weighing gold. Each *ratí* is an equivalent of 4 *mung*. The weight of precious stones is not expressed in *másas* or *tolás* but in *ratís* to any number. There is a distinct and complicated system of weights for pearls.

Milk is sold by measurement. Vessels containing a *Ser* and a *Páu* ($\frac{1}{4}$) are used as the units. The liquid *ser* contains 27 oz. of water and is equal to 1·35 pints English measure. Cotton and other raw material, food-stuffs, oil-seeds, vegetables, fruit, metals, *ghi*, country oil, etc. are sold by weight.

* There are exceptions. See " Hides" and " Animal Bones" above.

Weights and Measures.

Grain and seeds are also sold by measure, the table of which is as follows :—

4 *Chotháis*	=	1 *Páti*
4 *Pátis*	=	1 *Toya*
4 *Toyás*	=	1 *Kása*
60 *Kásas*	=	1 *Kharár.*

A *Kharar* is equal to 29½ bushels, English measure.

In the case of *juári, bájri* wheat, rice, *mung,* gram and peas a *Kharar* is considered to be equivalent to 24 maunds by weight. In the case of tilseed, oil seeds and paddy (rice in husk) a *Kharar* is considered to be equivalent to 20 maunds.

Cloth is measured by *Gaz* (ramrod) and *Hath* (cubit). A *Gaz* is equal to a yard of 36 inches, but the *Hath* varies in different parts of the Province from 18 to 27 inches according to local usage.

Carpets, matting and glass are sold by superficial measure.

Stones, masonry-work and timber are sold by cubic measurement.

Land for building sites is sold by superficial measure. In the case of agricultural land the unit is an acre or a *Jíreb,* 2 *Jírebs* being equal to one acre.

Canal clearance is estimated by cubic measurement, the unit being a *Gaz* of 4 feet, which means 64 cubic feet.

INDUSTRIES.

Industries.

The Census of 1901 showed (see page 190) that only a very small proportion of the people of Sind lived by industrial arts, and it may be added that of that small proportion the best part is foreign. Of course there are the common artisans indispensable in every community, the carpenter, the blacksmith, the potter and the jeweller, who do not differ much from those found in other parts of India and call for no remark. In the large towns there are skilful carpenters, who, if furnished with designs, can turn out most excellent furniture ; but these hail from the Punjáb, or Cutch, and are probably to some extent a product of Technical Schools like the Mayo School of Art at Lahore. There are also workers in fine arts for which Sind, or particular towns in Sind, had at one time a great reputation. But these arts have, without an exception unless it be lacquer ware, decayed and the workers

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have diminished in skill as much as in numbers. Some industries from Europe have come in the place of those that are passing away, and machinery is finding its way into the country; but it offers employment to only a small number as yet. In all Sind the number of factories worked by steam, in the sense of the Factories Act, is only 39 and the average daily number of operatives employed in them only about 8400. Two of them are Government concerns, an Arsenal and a Printing Press at Karáchi, and two are the Railway Workshops at Karáchi and Sukkur. Of the remainder two are Bone-crushing Mills, two Metal Foundries and one a Tin Work connected with a Bulk Oil Installation, all at Karáchi. The remaining thirty are Cotton Ginning, Cleaning and Pressing Factories, of which 6 are in Karáchi, 23 in Hyderábád and one in Thar and Párkar. In these the cotton collected in the districts is prepared for despatch to Karáchi, as already mentioned. Machinery driven by steam, but not amounting to a factory (*i. e.* not employing at least 50 hands), is to be found in many towns. In Karáchi there are 2 large Steam Flour Mills, and 4 Ice Factories. Small flour mills and machines for husking rice and sodawater machines may be found in many places. These give employment to an inconsiderable number of hands. Iron presses made at one of the foundries in Karáchi are to some extent superseding the old wooden treble roller (*chichro*) by which the juice of the sugarcane is expressed, but for extracting oil from jamba and other seeds the wooden press (*gháno*), worked by bullocks or a camel, is still in use everywhere.

SHOEMAKING.

Of manual arts the one that employs the largest number of persons is shoemaking. According to the last Census this kind of work maintained 31,568 of the population, including families. It is chiefly in the hands of *Sochis* and *Mochis*. The former word indicates Hindu Shoemakers of Sind, Márwar and Cutch, while the latter in Sind usually indicates Musalmans of the Menghwár caste. The *Márwáris* devote themselves more particularly to the manufacture of leather covers for camel saddles (*nat*) and this involves the art of embroidering leather with silk. An elaborately embroidered *nat* represents the "highest degree of excellence attained in artistic leather-working in the Presidency"* and can

* Tanning and Working in Leather in the Bombay Presidency, by J. R. Martin, B. A., I. C. S.

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cost Rs. 450. Hyderábád was famous for this work. The leather which makes the best quality of *nats* is that of the hog deer. Formerly much work of a finer kind was done, especially at Hyderábád and Tatta, such as the manufacture of saddles, gaiters scabbards, swordbelts, jesses and gauntlets for falconry &c., but there is little demand for such goods now.

TANNING.

Tanning is closely associated with shoemaking, but is the province of distinct castes. Hides of cattle are tanned by *Játias*, *Menghwárs* and sometimes *Makránis* and skins of goats and sheep by *Kaláls*. The process is very simple, but the leather of Sind is considered better than most Indian leather and is exported to Europe.

Camel hides are tanned in the same way as cowhides and the leather is used for the same purposes, but is considered inferior. Raw camel hides are much employed in making "dabas" for storing *ghi* and oil.

COTTON WEAVING.

The increase in imports of European and Bombay piece goods spells the passing of the handloom weaver, but the industry still supports a larger number of persons in Sind than any other except shoemaking. The articles manufactured are trouser-material, bed-covers, towels, scarves and tape. The production of trouser-material known as *súsi* occupies 400 looms in Nasarpur and 500 looms in Hála, which are important centres of this industry, and 250 at Tatta. The cloth, which is used by Amil men, the poorer Lohána women and Musalman women generally, is made in pieces about 21 yards long and 23 inches wide ; the warp is invariably striped but the weft never. Bed-covers (*khes*) generally consist of two folds interwoven so that the pattern appears on both sides. The better qualities, made of Bombay and Madras yarn, exhibit neat and varied though simple designs: for the cheapest kind, made of locally-spun yarn, blue and white are the only colours employed. A coarse cloth, called *jori* and used for towels (*angosho*), is made of local yarn, either plain white, or with a red or blue check on a white ground. Scarves (*lungi*), used as turbans or waistbands, are woven in pieces of from 6 to 12 yards by 18 inches. Coloured tape (*agath*), used for trouser-strings, is made by the women and children of the *súsi* and *khes* weavers, who employ a simple contrivance in lieu of a loom.

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WOOLLEN TEXTILES, RUGS AND CARPETS.

The woollen textiles of local manufacture consist of carpets, rugs, blankets and sacking. The weaving of rugs, or floor-mats, of wool and cotton employs the leisure of *Jat* and *Baluch* women in scores of small villages. Those made in the Guni Taluka of the Hyderábád District and the Karáchi Kohistan are accounted the best. They are made of wool (*un*), or of goats' hair (*dás*), or of both; in some the warp is of cotton. They are used for sleeping on and for kneeling on at prayers. The better quality made of wool, or of wool and cotton, is called *farási*: a cheaper and coarser rug made of goats' hair is termed *kharir*. The wool is coloured locally with vegetable dyes. *Farásis* are usually 6 feet long and 4 feet wide: the price ranges from Rs. 8 to Rs. 15, though a more expensive article is procurable to order. *Kharirs* of the same size fetch about Rs. 6. Very durable rugs of this kind are made in the Thar and Párkar District of undyed camels' and goats' hair. Rugs are also made as saddle-cloths (*tapar*) for riding camels: they are made in two pieces, which are stitched together at the ends, leaving an aperture for the camel's hump. Sacking (*boro*) is made of goats' hair and is used for horses' nose-bags (*tobro*), saddle-bags (*khurzín*) and grain bags and double sacks for pack camels and bullocks. It is usually black or dull brown and is extremely strong. A strip 9 feet long and 3 feet wide costs Rs. 3. Another industry of the Thar and Párkar District is the weaving of blankets (*khatho*) similar to the *kambli* of the Deccan, but white and finer in texture, the wool of which it is made being superior. It is made in long strips 2 feet in width, which can be cut and sewed together to make a blanket. Such a blanket, 9 feet by 4, costs about Rs. 2. They are exported in large numbers by land to Cutch and Márwar.

Woollen pile carpets are made in Bubák town for sale and in the Upper Sind Frontier for domestic use. The following account of the Bubák carpets is by Captain H. J. R. Twigg, I. M. S., Superintendent of the Hyderábád Jail:—"In about ten houses and eighteen vertical looms all the carpets of Bubák are woven. The workers seem to be members of one large family reputed to be derived from slaves from Persia, whereby they account for the so-called Irani pattern of the carpets made there. The entire trade is in the hands of not more than three Banias, while a dye-seller in the Bazar sells aniline at a handsome profit. There are two, or at the most three, patterns, the two cheaper selling at

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10 annas, the dearer (Irani) at 12 annas a foot. Each carpet is usually 7 by 4½. One weaver attends to the whole of such a carpet and in a week the entire work is finished. A task of one foot or more a day is only possible by putting in outrageously thick weft threads. A cheap Bubák carpet, critically examined after removal from the loom, is really a blanket-like fabric exalted by having, alternating with the purely blanket-like weft, stripes of woollen pile. After a little wear the pile stripes intermix and a carpet-like appearance follows. Not chiefly boys, but decrepits, do the work, as if a man unfitted for husbandry can fall back on carpets. The pattern is not read out, nor are square papers used, the pattern being learned in childhood by members of the family daily watching the work. Thirty persons in all find direct or indirect employment, contrasted with a hundred engaged in making trouser cloth; Rs. 1,500 are invested against Rs. 5,500 for cloth. The Musalman workers take advances and 4 annas a day is the wage earned. Two hundred carpets of the cheaper kinds are made annually. At such a rate the demand remains high, as few care to work when cultivation offers better prospects. * * * "The general quality is very bad. The two cheaper designs contain much yellow and white on a black ground, with groups of floral figures and a border or two with what is called the reciprocal trefoil pattern. The Irani design is a very poor attempt at a tortuous arrangement of vine and leaves. The industry well recompenses the capitalist as the prices are as low as the quality." This is the present condition of the indigenous carpet-making industry in Sind. Those made in the Upper Sind Frontier are the work of Baluchi women. They are quite different in character and are said to be very substantial, but they are not easily obtainable as they are not intended for sale, but are given with the marriage dowries of daughters and are kept as heirlooms.

If anywhere there is hope of the revival of highclass carpet weaving in Sind, it is in the jails at Sukkur (formerly Shikárpur), Hyderábád and Karáchi. In these places, under enthusiastic supervision and with models from Persia, Baluchistán and the tombs of Bijápur, beautiful woollen carpets are now produced which readily command a price of Rs. 2 per square foot, or more. Of late aniline dyes have been entirely discarded and the old vegetable dyes of the native weavers introduced. Many other woollen fabrics

are made, as well as cotton carpets and "durries," which it is needless to describe here as the jails are well known and open to visitors. **Industries.**

SILK WEAVING

The spinning, dyeing and weaving of silk was at one time the industry for which Sind was more celebrated than any other. In the palmy days of Tatta its looms for the weaving of shawls and *lungis* were said to number 5,000; and up to the time of the British conquest, when Tatta had utterly decayed, silk still held an important place in the trade and industry of the country, a fact of which there is abundant evidence in the reports of several officers. Lieutenant Postans, writing in 1840, enumerates, among the goods brought to Shikarpur by caravans from Kandahár, raw silk of six distinct qualities from Bokhára, Herát and Yezd, and the following dye stuffs :—*rodung*, or madder, saffron, safflower and *muságh* (*i. e.* a dye prepared from walnuts); also tinsel thread for embroidery. The silk, he says, was spun and dyed at Shikárpur and then sent to Sukkur, Rohri, Khairpur and as far as Sehwán and Tatta to be woven. Captain Hart, reporting in the same year on the trade of Karáchi, mentions among the imports raw silk from Bombay and Muscat, and dyes, cochineal and *rodung*; but among the exports are "loongees and mushroo" to Muscat. The industry has gone on declining since that time. *Lungis*, the rich scarves which are mentioned by early travellers in Sind as the most distinctive articles in the dress of the Mírs and which were at that time worn by every man of position, are now going out of fashion, while other silk fabrics can now be imported cheaper and better than any handloom weaver can make them. Nevertheless silk weaving still goes on in Karáchi, Tatta, Rohri, Jacobábád and other places. In place of raw silk, yarn is obtained from Bombay and Multan, and chemical dyes, as Custom House returns show, have to some extent displaced the *rodung, musagh* and safflower of Kandahar. The fabrics now made consist of *Garbi, Mashru* and *Lúngis*. *Garbi* and *Mashru* are fabrics of silk and cotton, strong and rather rough in texture, like most Indian silks. They are made in lengths of about 30 yards, with a width of ¾ of a yard. *Garbi*, which is sometimes called *tasar* but is not made of tasar silk, sells for 20 or 30 rupees a piece and is much used for trousers by well-to-do women of both communities. *Mashru*, which is good for cushion covers, quilts and many other purposes, costs as much as Rs. 60 or 65 per piece. *Lungis*, being intended for use

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as turbans, scarves, or waistbands, vary in length from 8 to 12 yards and may cost anything from 8 to 100 rupees, according to quality and especially to the degree and kind of ornamentation on them. They usually have the woof of cotton and the warp of silk, while the ends are always fringed and embroidered with gold and silver thread. Embroidery is mentioned further on.

Minor branches of the silk-weaver's trade are the making of silk cord for suspending necklaces and other ornaments, tassels, fringes and tapes for trousers. The workers are *Pátolis.*

DYEING.

It is a curious fact that, of the cotton dyers in the Bombay Presidency, three-fourths are found in Sind, which contains both Hindus and Musalmans. One of the principal dyeing castes, the *Khatris*, or *Khatis*, is supposed to have immigrated into Bombay from Sind. The industry has three branches, cotton dyeing, silk dyeing, and calico printing: wool is also dyed for their own purposes by the carpet weavers of Bubak. Cotton dyers are in all Districts. They are *Khatis* and also *Lohanas* and men of other castes, both Musalman and Hindu; but Hindus do not dye with indigo. Excepting indigo, the dyes used are mostly imported. Silk is dyed in the Karáchi, Hyderábád and Thar and Párkar Districts by *Pátolis,* a small caste which includes both Hindus and Musalmans. The silk yarn is brought from Bombay or Multan, and dyed here with indigo and imported colours. There is nothing special in the process. Calico printing is practised everywhere in the Bombay Presidency, but the prints of Sind surpass all others. The printing is effected by means of small wooden blocks, or dies, with handles attached, which are first pressed on a folded cloth soaked with the desired dye and then stamped on the cloth like an office seal. The cloth is previously prepared by dipping in a mordant of alum, gum and fuller's earth (*met*), and if it is intended to have a ground colour, it is sprinkled immediately after the stamping process with powdered cowdung. This adheres to the damp pattern and protects it when it is afterwards dipped in a dye of a different colour. Native dyes are used for calico printing and the colours are fast. These printed cloths are used by the natives as shawls and sheets, but they make pretty and very inexpensive table covers, wall curtains &c., the designs being often very pleasing. The workers can earn 10 or 12 annas a day. Tatta used to be especially celebrated for this kind of work. It

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is still carried on there and also in Karáchi, Jerruck, Hyderábád and other places.

BOAT-BUILDING.

Boat-building must always have been an important business on the Indus and it is so still. The plan and method of construction of the Indus boats, as they were 60 or 70 years ago, have already been described under Navigation. In these there has been little or no change, while in the materials used there has been a great improvement since those days. The timber employed now is generally *dayal* or *dayar*, i. e. the well known "deodar" (*Cedrus deodara*), of the North-West Himalayas and Afghanistán. It is said to be cut by Pathans and brought to Pesháwar, where it is bought by *Punjabis* and floated down the river to Sukkur. At Sukkur it is worth Re. 1-2-0 or 1-4-0 per cubic foot. The owners of the yards at Sukkur are mostly *Punjabis*, but some are *Lohanas*. The workmen appear to be all from the Punjáb. The same class of men are engaged at Sukkur in sawing timber for railway sleepers and other purposes. The yards at Kotri are much less extensive than at Sukkur, but the work done is similar. Teak wood from Malabar is sometimes used at Kotri. It costs three times as much as deodar, but is considered even more durable.

There are many other common industries which support hundreds of persons but present no point of special interest, such as the making of brass cooking-pots, grinding-stones, mats and baskets of palm leaves and grasses &c. The special arts for which Sind was famous in times past, besides the weaving of *lungis* and printing of calico already mentioned, were embroidery in silk and gold and silver thread, inlaid gold and silver ware, lacquer-ware and glazed pottery. Fifty years ago the "Sind-work-walla" was a familiar figure in Bombay, whence he travelled as far as Egypt and Malta and established imposing shops. He remains to this day and grows rich, while the men who wrought the beautiful things that he sold only grow poor. There are said to be 5,000 of these Sind merchants at this time in different parts of the world, and the money that they bring or send home has contributed much to the present wealth of Hyderábád city; but they now sell the curios of China and Japan, Benares, Amritsar and Madras, rather than the productions of Sind, which are passing away. Even thirty years ago, it is said, there were in Hyderábád a hundred workers in that beautiful embroidery in gold and silver

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thread and silk, upon silk cloth or velvet, known as *Chikimdozi*; but there are now barely 25 and they are in poverty. They cannot compete with the cheap work of similar appearance that comes from Madras and other places. The men who inlaid swords and daggers and scabbards with gold and silver have disappeared, and of those who inlaid gold and silver ornaments for the wrists and ankles of native ladies with red and blue and green, only five or six shops remain; for even the taste of women in jewelry changes like everything else. But such of these arts as still languish on deserve some notice.

EMBROIDERY.

Embroidery in silk or gold and silver thread was in great demand at one time for the decoration of shawls, coats, caps, ladies shirts and children's trousers. The professional embroiderers were all Musalmans and some of them still survive in Hyderábád, Shikárpur and other towns. Persons who wish a garment embroidered take it to them and pay for the material and the labour. In the Technical School at Khairpur an earnest attempt is being made to revive the art, and schools for the same purpose have been started at Jacobábád and some other places. The learners begin in early childhood and go through a regular curriculum. The pupils of the lowest class sit in a row on the floor, tortuously twisting, stretching and bending back the fingers of the right hand with the left until they have reduced them to the condition of gutta percha. Then they are promoted to the second class and each gets a piece of coarse cloth and a needle, which is rather an awl with a short wooden handle. His task is to prod the cloth with the needle as fast as he can. At the next stage he gets a thread to his needle. When the whole course is completed the rapidity with which he will work out the most intricate pattern of flowers and leaves will be astonishing. Whether the professional embroiderer can be saved is very doubtful, but the art has now taken root in domestic soil and employs the leisure of hundreds of women in the best Hindu and Musalman families. This kind of work, in the form of slippers, cushions and table covers, is too well known to require description. It exhibits the variety and elegance of design which is characteristic of all Sind work. When done in real gold thread it is of course very expensive; but much imitation thread, "made in Germany," comes into the market now and is used by the foolish workmen because it is cheap, to the discredit of Sind work. Another interesting variety

of the embroiderer's craft is found where one would not look for it, *viz.* in the desert of Thar and Párkár. The ladies of those parts greatly affect petticoats of *chuni*, which is the coarsest cotton cloth dyed red and deeply embroidered with silk in many colours, with little bits of looking glass let in. This is made in widths of about 18 inches, so it takes three widths, one above another to make a petticoat; but the uppermost need not be embroidered. A length of about 5 yards of this material can be had for Rs. 5 and it is very effective on a mantel-piece. It is not made only for local use, but exported in some quantity to Márwar.

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LACQUER-WARE.

The art of lacquering wood is one that does not appear to have deteriorated, though the number of workers may have diminished. This kind of work is hawked about all over India as "Sind-work-bokkus," in the form chiefly of nests of round boxes fitting one inside another and all beautifully lacquered in red, yellow, black and green. The hawker's samples are of the poorest quality. Many other colours besides red, yellow, black and green are employed and many exceedingly pretty articles made, such as vases, cups, candle-sticks and rulers. But the principal indigenous application of the art is to the glorification of bedsteads and of those swinging cots and cradles which are found in the house of every prosperous Sindhi gentleman. The work is commonly spoken of in Sind as "Hála work," because Khánot in Hála is the principal centre of the industry, but it is carried on in other places and there are even peripatetic lacquerers. Kashmor in the Upper Sind Frontier District is noted for a special kind of ware with a black ground and the pattern in fine silver lines. At the Technical School in Khairpur work of a very high class is done and there is a similar school at Kandiáro in the Hyderábád District. The best wood for this work is that of the White Poplar (*bahan*), but that of the Tamarisk (*lai*) is also employed and even babul. The article, having been turned in the lathe and polished, is put back into the lathe (which is the common wooden implement employed by all Indian turners and worked by means of a bow) and turned swiftly while the lac is pressed hard against it. The lac is the produce of Sind (see Productions) and is prepared for this purpose by being mixed with various pigments and melted, together with wax and sulphur, and cast in flat cakes which have the consistency of artist's dry water colours. When one of these

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cakes is pressed against the rapidly whirling wood, the heat generated by the friction melts the cake slowly, so that the surface is covered with a layer of it. The first layer put on is of course that which is to be the ground colour. On this the worker next proceeds to engrave the intended design with a sharp iron tool. He has no scroll, nor even a copy to follow. It is all "free-hand" drawing from a design in his own head. When this is done the piece goes into the lathe again and is wholly coated with another colour, which is no sooner put on than it is rubbed off again with a wet rag and sand till the ground colour re-appears. But the second colour remains in the engraved pattern. This process has to be repeated as many times as there are colours in the design. The mottled pattern so common on nests of boxes is produced by using a stick of much harder lac for the second colour, without any previous engraving, and moving it about irregularly as the lathe turns. It indents itself into the lower layer of softer lac, and when most it has been rubbed off with sand, a mottled pattern remains. Another method, which is employed in the beautiful bronzed ware, is to put on two layers of lac of different colours and engrave the design deep enough to make the lower appear. The whole is then smoothed with an oiled rag, while a pan of burning charcoal is held near it. For bronzed ware the surface of the wood is always coated with tin, by simply painting it with melted glue with which a small quantity of tin has been blended, and then polishing with a smooth stone instrument.

GLAZED POTTERY.

The following description of the glazed pottery of Multan, which does not differ from that of Sind, is by Mr. Lockwood Kipling,

"The glaze faience is a relic of the time when mosques and tombs were covered with this beautiful material. Until a comparatively recent period the work was exclusively architectural, and consisted of tiles painted in dark and light blue, with large geometrical patterns, for wall surfaces, finials for the domes of tombs, the Mahomedan profession of faith painted in bold Arabic characters for tombs, panels of various sizes for lintels, door jambs and the like. The European demand has developed a trade in flower pots, large plateaux for decorative purposes and many varieties of the comprehensive word 'vase.' The work differs technically from the pottery of Sind, which had the same origin, in that its decoration consists solely in painting in two or three

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colours on the glaze or enamel, the use of the coloured or white 'slips,' which gives a raised appearance to the patterns on Sind ware, being unknown, or at least not practised. The colours used are a dark blue from cobalt and a very fine turquoise from copper. The 'biscuit' and 'ghost' firing is done at one operation, that is, the article is made in clay, sundried, covered with glaze and painted at once. The green glaze is said to require that preliminary burning of the clay which is invariably given in European practice. The demand for this ware is greater than the supply and it is to be regretted that more enterprise and intelligence are not brought to bear on a craft which has, to begin with, first rate materials and good traditions. No more suitable material for wall-decoration could be devised, but little use has been made of it for this purpose."

All this is as true of Sind as of Multan ware. The reason why little use is made of it for wall-decoration is that it is quite unfit for such a purpose. The art of making bricks and tiles like those in the tombs on the Makli hill, or in the mosques at Tatta, has been lost. After two centuries they ring like metal and show edges as clean as the wooden bricks in a child's box, while the enamel remains as transparent as on the day when they were made. But the Sind pottery of the present day is difficult to carry without breaking and flakes, or chips, if exposed to the weather. The designs are very various and almost always artistic and beautiful, but the material is mere earthenware fit only for flowerpots. The clay now used is the silt of the Indus, and undergoes little sifting or preparation of any kind. The firing is done in an ordinary kiln and 10 hours is considered sufficient. In addition to the blue and green, mentioned by Mr. Kipling, there was in the old bricks a fine buff tint, which is imitated at the present day by mixing cobalt with a red pigment which is perhaps red ochre. There was a fine blue-green tint the receipt for which is lost. Many other colours are used now. Hála is the chief seat of this craft also, but it is carried on in Nasarpur, Guni, Tatta and perhaps other towns.

STUCCO WORK

In connection with enamelled tiles may be mentioned another kind of mural decoration which once flourished in Sind, or rather two kinds, namely, stucco work (*chíroli*) and painting on the same. The stucco was made from the gypsum found so plentifully in Sind (see Productions, page 81) and the worker moulded it with

his finger nails, or with simple tools of wood or iron. Sometimes the surface of the stucco was left unsculptured and painted by a class of artists known as *Kamángar* in water colours. The pictures consisted generally of representations of flowers, birds and beasts as the Indian artist is apt to conceive them, but the colours were bright and permanent and the result effective. This kind of decoration was very much in vogue both among Musalmans and Hindus in their houses and examples of it may often be seen in tombs. The painter, it is said, has almost become extinct and stucco work is going out of use.

ENAMELLED METAL.

Sind has never been famous for metal work, excepting the inlaying and enamelling of gold and silver already mentioned. Enamelled jewelry is going out of fashion and Zamindars no longer value themselves by the trappings of their camels and horses, as they did once ; so the art is dying of starvation. There are four or five shops in Hyderábád still for the sale of this work.

IVORY CARVING.

Ivory carving was another art practised in Hyderábád. The ivory was obtained from Bombay and the hollow part cut into those ridiculous bracelets with which Sindhi women once did and Gujerat women still do sheathe their arms. The solid part of the tusk was carved into dice, spinning tops, spoons, scent bottles, paper knives and other knickknacks. The ivory carver of Hyderábád is said to have succumbed to his more skilful rival in Amritsar. It is probable he came from there himself originally.

BRASS WORK.

Ghotki in the Sukkur District has a local reputation for a kind of brass work which is curious rather than artistic. It consists of small fancy articles, such as snuff-boxes and rose-water sprinklers, sculptured and enamelled.

CHAPTER IX.

REVENUE.

Tables XXII-A, XXII-B, XXIII, XXIV, XXV, XXVI-A and XXVI-B.

Land Revenue.

Land Revenue. TALPUR SYSTEM.

Under the Talpur rulers the land revenue was generally taken in kind by means of a division of the produce known as *batai* (*i. e* division). The state demand varied with the nature of the irrigation employed. For crops grown on land irrigated artificially the prevailing rate was from one-fourth to one-third of the gross produce, while for crops raised on land naturally flooded the customary demand amounted to two-fifths or one-half. But the rates varied much, local usage being everywhere regarded. An additional cess, generally of one-fifteenth, was levied, also in kind, to defray the cost of the establishment employed by the state, and a number of petty fees were exacted to provide perquisites to the officials or subsistence to their menials. These additional charges constituted a heavy tax upon agriculture. Cash rents were taken on certain crops (called *mahsúli, i. e.* taxed crops) such as sugarcane, cotton, tobacco and vegetables, which not being gathered in one operation do not readily admit of partition. Upon these rents also additional charges, amounting on an average to 9 per cent., were levied for the same purposes as were the cesses and fees exacted from the payers of rent in kind. On cornland sometimes, especially in Chanduka, there was another system of payment in kind known as *kásagi*, the Government demand being fixed at 7 *kása* per *kharár* on the *computed* produce of the field, which works out theoretically to about one-fourth. The rate was very high, but remission could be claimed if the crop was bad. By yet another system, known as *Rakab-ira*, the cultivator could commute his grain rent for a payment in cash calculated on the value of the estimated crop at the current price of grain in the nearest large towns.

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But the revenue was frequently farmed under the Amirs. Upon payment of an advance the farmer was allowed to take full possession of the tract farmed and to oust the regular officers of the Government, whose places he filled with his own men. The system provided little check upon oppression beyond the farmer's self-interest, and even this restraint ceased to operate when the farm was taken for a short period. The exactions of the farmer sometimes compelled the landholders to come forward in self-defence and offer a larger sum for the right of collecting the revenue, and, no matter at what stage it might be made, a higher bid generally secured the displacement of the farmer by the new-comer.

EARLY SYSTEM UNDER THE BRITISH.

Upon the introduction of British rule the system was not immediately changed, though the state demand was limited to one-third of the produce, and this share seems only to have been taken on lands irrigated without the aid of machinery: the proportion of the crop taken on lands to which water was required to be lifted was one-fourth. Money rents were fixed at Rs. 1-8-0 per bigah,* equivalent to a rate of Rs. 2-10-0 per acre, in Lower Sind, and at Rs. 2-8-0 per bigah in Upper Sind. The old fees and cesses were at the same time abolished and a uniform charge of 4 *kásas* in the *kharár*,† equal to one-fifteenth of the produce, or in the case of cash assessments of 6 per cent. on the rent, was substituted to defray the cost of the collecting establishment. A water-rate of 3 *kásas* in the *kharár*, or one-twentieth of the produce, was also levied.

The revenue regulations issued by Sir Charles Napier in 1846 recognised the advantage of substituting for the ancient method a system of money payments, which was attempted, but with little success. In April, 1848, Sir George Clerk, Governor of Bombay, who had visited Sind immediately after Mr. Pringle's appointment as Commissioner and thoroughly investigated the whole system, wrote as follows:—

"Having seen then how imperfect and indeed how utterly

* The Napierian bigah contained 2,500 square yards, or 80 square yards more than half an acre.

† The *kharár* is a grain measure containing 60 *kásas*. Its contents are approximately equivalent to 3 quarters English measure and, on an average of the five staples, wheat, rice (unhusked), juari, bajri and jamba, to a weight of 28 Indian maunds of 82 lbs. each.

worthless are all the checks which we possess under the present system, be it of minute division of grain or of money commutation, I regret that, on our acquisition of the country, we did not avail ourselves of the existence of zemindars, muccadums, heads of tribes and other village communities to relieve ourselves from details so complicated that we could not possibly enter on them with any hope of success. We might, I think, have arranged to compound for a short term of years with the zemindars for a fixed amount, either in grain or cash, in supersession of the system of grain division in their zemindarees; and in cases where zemindars were not to be found, similar agreements might have been made with village communities, or particular tribes in a village community. Our collectors and deputies would then have been no longer buried in a mass of details; and they might have availed themselves of their daily increasing knowledge to devise and mature some plan for a more permanent arrangement."

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"I am of opinion that the Commissioner should be instructed immediately to enter into arrangements of this nature, the same to hold good for from three to four years."

FIRST SETTLEMENT.

What followed is clearly summarised by Mr. Baden-Powell in his Land Systems of British India. "Upon the introduction of civil administration, in 1847, a seven years' Settlement was made by measurement of crops and commutation of the Government share at assumed prices on *raiyati* lands, and by leasing out the *zamindári* estates at lump-rents. Prices subsequently fell, the assessments proved heavy, and the Settlement expired in 1853-54 amidst general demands for reversion to the old Native system of dividing the crop and taking revenue in kind. At the same time the revenue records were exceedingly imperfect. There were no village maps, nor even any taluka lists of villages; boundaries were undefined, and land-registers were unknown, all existing information being exhibited under the name of the person by whom, not of the place for which, revenue was to be paid. It was therefore determined to institute a 'rough survey and Settlement,' as a preliminary to a complete revenue-survey and Settlement at some future time. Settlement Officers were to demarcate village-boundaries for the Topographical Survey then at work in Sindh, and were then to measure the fields, fill in the village-maps, classify the soils, and make the Settlement."

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"This 'rough survey and Settlement' went on till 1862. By that time about one-third of the province had been surveyed for Settlement purposes, at a cost of 8½ lakhs, but no Settlements had been made, the Settlement Officers having been fully occupied in demarcating boundaries for the Topographical Survey, and afterwards making their own interior survey of the villages. In the absence of precise rules, the system followed had more or less modelled itself upon the Dakhan revenue survey, and the assimilation was now made complete by the deputation, in 1862, of a Bombay Settlement Officer to draw up a scheme of classification (of soils) and Settlement. The rules then framed still form the basis of Settlement operations in Sindh, though in practice they have been subjected to great and material modification as regards details, so that the present form of Settlement differs largely from that adopted about 1864-65, the failure of which became more and more evident eight or ten years later. The organization of the department was completed by 1864-65, and regular survey and Settlement work has been going on ever since. At first there were two Superintendents, one upon the right bank, and the other on the left bank, of the Indus; but a single officer has had charge of the department since 1874."

"The classification rules of 1862 divided the land into four orders, differing from each other in the proportion of sand, and these again are liable to be degraded by 'faults,' viz. the presence of salt, a sandy substratum, or an uneven surface. The second stage of the classification process relates to the nature and quality of the water-supply. The greater part of Sindh is watered by canals filled by the rising of the Indus. They are constructed so as to receive water during the inundation season, and most of them lose their supply when the river falls to low water mark. Some of them are under the Irrigation Department; others are managed by the zamindars. In the latter case, the zamindars are bound to do the annnal cleaning out and repairs, and the expenses are recovered by a special cess if the Government has to step in and take the duty out of their hands. Irrigation from these canals is either by flow or by lift, that is, by the Persian wheel. Besides the canal-water area, a considerable extent of country, especially in the Shikárpur district, is rendered capable of cultivation by natural flooding. These floods are quite beyond control and often do more harm than good; but where they are

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tolerably certain, as is the case with the Manchar Lake in the Kurrachee district, they are very favourable to the growth of *rabi*, or spring crops, especially wheat, on the land which has been temporarily submerged. Thus, in making the Settlement, water-supply has to be classed under one of three heads, viz. flow (*mok*), lift (*charkhi*), or flood (*sailábi*), and then further classified according to the sufficiency and constancy of the flow, the expense incurred in bringing the water by lift to the field, and the certainty and duration of the flooding."

"It must be remarked that there are two circumstances, one natural, and the other arising from land-tenures, which have made it difficult to adopt the Bombay system in its original form. As regards the first, the soil is such that land cannot be properly cultivatived year after year without fallow. This is said to be due partly to the absence of rainfall, partly to the abundance of waste, which renders it easy to adopt a kind of shifting cultivation. In the first, or 'original,' Settlement, the land was divided into rather large survey numbers; it was estimated what portion of the number could be cultivated annually, and the whole number was assessed on that basis only. This was what is known as the 'diffused rate' system. But the cultivators took an unintended advantage of it; they ploughed up the whole land in one year in a hasty and imperfect manner, and then, as the soil was exhausted 'relinquished' the entire number and took up new land. The 'original' Settlement was also marked by the difficulty already indicated about zamindars' waste. It was at first proposed to include all waste that fairly belonged to the zamindari in the survey; but then the Zamindars as registered occupants would be liable to pay the whole assessment; and this they were unable to do. In 1875 a proposal for leases on a reduced lump-assessment was made, but this was apparently still too high, for no one availed himself of the permission. Then it was that the new system came into force, which allowed assessment to be paid only on cultivated lands, but a lien to be retained on fields that were by custom left fallow."

REVISION SETTLEMENT.

"The revision Settlement is based on a more minute survey making the 'numbers' of a much smaller size. Each is regularly assessed; but the holder of land can register himself as occupant of as many numbers as are comprised in his holding, and can,

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under certain rules, allow some of the fields to lie fallow, retaining his lien on them (without payment) during the period allowed. If he chooses to cultivate, he pays full assessment."

But the abolition of the diffused assessments destroyed an automatic check against an individual holding more land than he was able to cultivate. To remedy this defect a rule was introduced requiring the payment of assessment on unoccupied land which had been allowed to lie fallow for more than a reasonable time. The scale adopted ranged from one fallow in four years for rice to three fallows in four years for lift lands.

IRRIGATIONAL SETTLEMENT.

The revision of the survey was necessarily a slow process and several years frequently elapsed after the expiry of the diffused settlement in a Taluka before the new one could be introduced. In the interval a temporary and experimental settlement was adopted which was called the "Irrigational Settlement" because, the survey and classification of soils not having been completed, attention was paid only to the method of cultivation employed in cultivating a field in each particular season. This gave so much satisfaction that it was decided in 1887 to adopt the system permanently. In this settlement the villages of a taluka are divided into groups arranged in accordance with the facilities which they enjoy for obtaining water and for the disposal of produce at a market. Rates are then prescribed for the different methods of irrigation in each group of villages. The pitch of the assessment is governed by the trend of prices, the value of land, the state of the canals and the economic condition of the cultivating classes. The introduction of this form of settlement began in 1882-83 and it has now been extended to the whole Province with the exception of the Kohistán and a few other places in the Karáchi District and some parts of Thar and Párkar, of which more hereafter. This settlement has recently undergone revision in some parts, which, however, only affects the character of the grouping and the scale of rates. Table XV in the B. Volumes shows the date on which the Irrigational Settlement was introduced in each Taluka of each District, the rates charged under it on each description of cultivation and the average incidence of the tax per acre on the whole area assessed; it is therefore unnecessary to say more on these subjects here, except that the rate ranges from Rs. 6-8-0 on garden lands in Sukkur to 12 annas

on grass and babul groves, and that the average incidence on all lands ranges from Rs. 3-15-0 in the Sukkur to Rs. 1-14-0 in the Dero Mohbat Taluka.

The leading features of the present settlement are :—

(a) Land only pays assessment when cultivated.

(b) The rate of assessment depends on the class of the water supply.

(c) Remissions are allowed on a most liberal scale in cases of total or partial failure of crops.

(d) Four clear years of fallow are allowed free of assessment without lapse of occupancy right.

Experience has shown the system to be admirably adapted to the conditions of lands settled on inundation canals. The assessment is treated as a consolidated charge: nine-tenths represent the price of the water and are credited to Irrigation, while the balance is treated as land revenue and credited to that head. A reduced assessment is charged on lands watered from private canals, the clearance of which is not undertaken by Government, the deduction being made on a sliding scale varying with the length of the canal. A cess of one anna per rupee of the land assessment is levied under Bombay Act VI of 1881 to defray the cost of the collecting establishment.

SPECIAL LOCAL ARRANGEMENTS.

The desert Talukas of Thar and Párkar are shown in Table XV as unsettled. In these the land revenue, such as it is, is raised on a system known as Tali, from *tal*, the local term for those patches of low ground between sandhills on which it is possible to raise a crop after suitable rain. The area which can be cultivated in each year varies with the rainfall, therefore the land revenue is imposed in the form of a fixed rent graduated according to the average productive area included in the whole. Thus in the Chháchhro Taluka an area of 5 acres or less is rated at Rs. 2, one of between 5 and 10 acres at Rs. 3 and so on. In the Kohistán also, where a sparse and precarious cultivation is carried on after rain, it has been found necessary to make special arrangements for levying an assessment which is little more than nominal and yet has frequently to be remitted.

BASIS AND INCIDENCE OF THE ASSESSMENT.

It has been stated above that the produce-share appropriated by the Talpur government, apart from cesses, as the contribution due from the occupiers of land to the revenue of the state, varied

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from one-half or two-fifths for land naturally irrigated to one-third or one-fourth for land watered by labour. For what length of time this rate had been sanctioned by usage it is impossible to say, but the Talpurs were conservative princes and as a rule respected local customs and hereditary rights. On the establishment of British rule the produce-share taken by the government was reduced to that which the Mughal emperors had considered fair, namely one-third; but this, it has been explained, was the maximum demand, made only upon land irrigated with the least expense; the lift rate, which applied to the greater portion of the country, was one-fourth. This then is the basis of the present assessment. On the introduction of cash assessment in 1849 the one-fourth share was commuted into an empirical rate of Rs. 24-8-0 per wheel, which may be taken as approximately equivalent to Rs. 2-8-0 per acre. The settlements current in 1904 result in an average demand of Rs. 2-13-0 per acre on all kinds of irrigation throughout the Province, and the average lift rate is of course a good deal less. The current settlement is thus nearly the same in money as the amount into which the produce-share of the state was commuted in 1849. But the relative difference between the rates of the two periods is far greater, for the records of sales of grain collected as revenue in the years 1845 to 1849 show that the average wholesale price of the five staple grains, *bájri, juári,* wheat, rice and *jamba,* was for that period scarcely one-third of what it is at the present day. This indication of the levity of the present assessment is confirmed by the results of crop tests undertaken in recent years. Between 1894-95 and 1902-03, 46 crop tests have been made by the Assistant and Deputy Collectors in the Hyderábád District, which may be taken as an example, and accepted after professional scrutiny. The experiments demonstrated that the assessment was about one-tenth of the gross produce. In twelve cases where the crop selected was estimated to be above the normal the incidence of the assessment was 5·22, in 18 cases where the condition of the crop was normal the result exhibited an incidence of 8·04, and in 16 cases where the crop was below the normal the assessment rose to 17·81 per cent. of the value of the produce.

But this does not by any means exhaust the question of the comparative burden borne by the peasants under the present assessment and under native rule. The rate levied by the Talpurs

on flow lands was from $\frac{2}{5}$ to $\frac{1}{2}$ of the total produce; but *in addition to this* every petty landholder and *maurusi* tenant paid to the the zamindar such cesses as might be forced from him under the name of *lápo.* The amount of these varied much, but in 1894 Sir Evan James decided from a great mass of data that they might be estimated on the average at one rupee per acre on all crops. In the same report he says that *lápo* is commonly levied still in all parts of Sind from tenants at will, even by the new class of *vakil* zamindars, in addition to the *batai* of $\frac{1}{3}$ or $\frac{1}{4}$; the deduction from which is that the difference between what has always been regarded in this country as the Sarkar's share, *viz.*, one-third, and the share which the Sarkar now takes, *viz.*, about one-twelfth, does not go to the cultivator, but to the landlord, except when the cultivator is the registered occupant. **Land Revenue.**

EXPANSION OF REVENUE. Detailed statistics of the revenue collections, remissions, &c., in each District are given in Table XXIII in the B. Volumes. The land revenue of the whole of Sind has risen from Rs. 67,47,311 in 1895-96 to Rs. 1,04,01,725 in 1904-05. Of the latter sum Rs. 6,15,805 were remitted and Rs. 2,19,156 written off as irrecoverable arrears, leaving a net demand of Rs. 95,66,764. The total of the remissions made during the decade was Rs. 48,54,199 being 5 per cent. of the revenue due. Rs. 8,84,924 were written off as irrecoverable arrears during the same period. The area under actual cultivation has increased from 26,55,188 acres in 1895-96 to 33,57,266 acres in 1904-05.

TENURES. The following clear account of the different tenures prevailing in Sind was written for the second edition of Mr. Hughes' Gazetteer of Sind (1876).*

"Land tenures are throughout the province of an extremely simple character. Classing the land under the two heads, "Assessed to the State Revenue" and "Alienated," we find it in the occupation of:—

(1) Large proprietors,—a comparatively small but important class.

(2) Holders of estates of a few hundred acres,—the middle class gentry.

(3) A large body of peasant proprietors, all paying revenue direct to Government, or to the Alienee to whom the Government rights in the land have been transferred.

* By Lieut.-Colonel R. M. Haig.

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The other agricultural classes are :—

(1) Tenants possessing a right of occupancy.

(2) Tenants-at-will.

"The latter class, though many of them pass their lives on the same estate, yet possess no kind of right of occupancy, and are subject to such conditions as the landholder may from time to time find himself able to impose on them. A prudent landholder, however, knows it to be for his interest to keep on good terms with his tenants, and understands the benefit of maintaining in his service a body of cultivators who have grown up on his property, hence most of these tenants-at-will have almost as secure a footing on the land they cultivate as if they enjoyed a right of occupancy. Their position has become still better since the introduction of the settlement, which in putting an end to the monopoly of land previously enjoyed by the larger holders, has rendered the tenant class much more independent than they formerly were."

"Tenants possessing a right of occupancy are found exclusively in North Sind, where such a tenant is termed a "Maurusi Hari," literally "Hereditary Cultivator," his right of occupancy being heritable. It is also transferable at the will of the tenant, and irrespective of that of the superior holder, or Zamindar, whose right in the land is strictly limited to a quit-rent, and this he cannot enhance. In fact the Zamindar is in these cases simply a person possessing a certain lien on the land, and although he is the superior holder, he is not allowed to pay the Government demand, which it exclusively belongs to the "Maurusi Hari" to discharge. This tenure is very prevalent in the Rohri Division and in the Sukkur taluka, less so in the rest of the Sukkur and Shikárpur Division, whilst south of Larkána and the territory of Khairpur, it is almost unknown. It appears to be of foreign origin, and to have spread into Sind from Bahawalpur and the Punjáb, where it is believed to be common. The hereditary right of occupancy is said to have been acquired formerly by any person who reclaimed land from the jungle and brought it under cultivation. All land at all accessible to a petty cultivator being claimed as in the "Zamindari" of some large holder, the rights of the latter were recognised by the payment of a quit-rent fixed for ever, and the cultivator became the occupant of the land with, in fact,

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every right of ownership. Occasionally, according to native accounts, which seem to have some ground of probability, the tenure arose the reverse way to that above described, that is, instead of a cultivator acquiring an occupancy in a Zamindar's land, a Zamindar acquired Zamindari rights over lands belonging to peasant proprietors, being foisted into this position by the corruption of the local ruler or the favour of some successful nvader. This would account for the fact that hereditary tenancy is found in full vigour in the lands adjoining a populous town like Sukkur, and which must have been reclaimed so many centuries ago that to suppose the original tenure to have come down to the present time unaltered and to so many successors would be manifestly absurd."

"The question of what are called "Proprietary" or "Zamindari" rights as pertaining to the larger landholders in Sind has been much discussed, and opinion is still divided on it. It is contended by some that Zamindari rights exist in this province just as much as in other parts of India. What these rights consist in has not been precisely defined by those who argue for them, but they appear to be connected with waste land over which it is maintained the right of the Zamindar ought to remain in force, even after he has relinquished the land owing to inability to cultivate it. The Muhammadan law, the only *law* to which a Sindhi landholder could refer the matter, recognises no right in land which has been more than three years out of cultivation. Such land reverts to the State absolutely. If custom is to decide the question, it would be difficult to say what the custom has been. Under the Native Governments, the powerful landholders no doubt acted on their own views of their rights, while the rulers gave themselves little trouble about the rights of others so long as their own were properly respected. The Talpurs appear to have recognised no special rights as pertaining to large landholders, and to have summarily ejected the latter from their lands when occasion arose for such a step, and in places where they were strong enough to venture on it. On the accession of British rule, it was found that at all events as a *fiscal* arrangement village communities were commonly divided into principal Zamindar, minor Zamindars, petty occupants (also calling themselves Zamindars), and the "Haris" or cultivators of the larger holdings.

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Where this organisation prevailed, the principal Zamindar transacted all business with Government on behalf of the community, and from him or under his supervision the Government share of the produce of the village lands was collected. On account of this he levied "Zamindari" (for his trouble as principal "Zamindar") from *all* occupants of the village lands in addition to the "*Malikano*," or proprietor's (Malik) fee levied from the tenants of his own particular estate. There can be no doubt that under the circumstances of the Native Governments this was by far the best, if it was not the only possible, arrangement for collecting the State dues. There was at least one high authority* in favour of continuing the system under British rule. But Sir Charles Napier was strongly opposed to it. He likened the larger Zamindars to the middlemen of Ireland, and urged the Revenue Officers to displace them, wherever it was possible, from their position of village managers, and to deal directly with the occupants of land whoever they might be. Thenceforth the larger Zamindars ceased to enjoy much of the influence and importance they had hitherto possessed, and the smaller occupants came to appreciate the advantages of being independent of the large proprietors, and of having their own rights as holders of land fully recognised by the new Government. The policy of British administration has been to foster this desire for independence, and to place all classes of landholders on precisely the same footing in regard to their obligations to the State."

LAPO.

With respect to Zamindari rights, about which Colonel Haig held views different from those of some authorities, the following remarks may be quoted from an official report on the land tenures of the Bombay Presidency.†

"Under the former native rule certain individuals were granted the privilege of collecting certain fees on the revenue accruing from the lands of a tract of country in consideration of their using their influence in bringing it under cultivation and collecting the revenue on the same. They attracted cultivators, probably advanced them money on account of the expenses of cultivation, afforded them the protection necessary in the then unsettled state of the country and aided in the collection of the revenue; and the

* His Excellency Sir George Russell Clerk, Governor of Bombay.

† Selections from the Records of the Bombay Government. No. CCLXXVIII.—New Series.

"*lápo*" was the consideration they received in payment of their services; the "*deh kharch*" (or village expenses) was probably an extra cess which they levied from their cultivators to meet the cost of entertaining Government officials, guests &c. and the "*malkáno*" and "zamindari" were other names for the above or similar benevolences. They all, however, have one common meaning, viz., a charge on cultivation, payable sometimes in kind sometimes in cash, which the zamindar is by custom entitled to receive from the cultivators."

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This right has never been abrogated and in cases in which *maurusi haris* have refused to pay *lápo* the Zamindar's claim has been upheld by the civil courts. But the claim has been disappearing gradually in the Hyderábád, Lárkána and part of the Sukkur District, as waste lands, formerly included in the estates of Zamindárs but lapsed by neglect, have been taken up by new occupants under no obligation to pay *lápo*. In the Rohri subdivision, however, where the most influential landholders, some of whom hold *sanads* from the Emperors of Delhi, derive the larger part of their incomes from *lápo* and are powerful enough to enforce the payment of it without the countenance of the law, it shows little tendency to disappear, and the question what attitude Government should adopt towards it has given rise to interminable correspondence. The final orders of Government on the subject are that Revenue Officers may give assistance under the Land Revenue Code to superior holders in recovering *lápo* claimed to be due from persons whose liability to pay it is entered in the settlement registers. Where no such liability was recorded at the time of the settlement, or where a new and free title has been acquired subsequently, assistance may not be given under the Land Revenue Code, but of course the claim may still be the subject of a civil suit. With respect to recording liability at the time of settlement it may be said that the general policy of Government has been not to recognise the shadowy claims of Zamindars over lands which were waste until Government brought water to them, but to show every consideration to the hereditary landholders of the country in the subsequent disposal of such lands.

Tenants at will and "2nd class *maurusi haris*," who differ from tenants at will only in this, that the landlord cannot eject them as long as they pay him his dues, are of course bound by the terms of

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their contract with the landholder, which appear very generally to include the payment of *lápo*. But as the expansion of cultivation increases the demand for field labour and the independence of the labourer, he may be expected to release himself from such claims.

SIZE OF HOLDINGS.

The position of the Zamindars in Sind is not what it once was. Estates are continually suffering disintegration owing to the custom of dividing a father's property among his sons at his death, and very many have passed into the hands of the *nouveaux riches* by the foreclosing of mortgages incurred during the unfortunate "diffused settlement." The breaking up of the large estates formerly held by old families has been a matter of concern to Government and a comparision of the holdings in 1903-04 with those recorded in 1894 seems to show that the action of the Irrigation Settlement, the Incumbered Estates Acts and other measures taken by Government on their behalf, together with their own advance in education, has arrested the decay of the landlords. The number of holdings of different sizes in the whole Province is shown below.

37,680	Holdings	within 5 acres,
74,016	„	from 5 to 25 acres
31,898	„	from 25 to 100 acres
9,530	„	from 100 to 500 acres
1,801	„	over 500 acres

Lands held on the Special Tenures mentioned below are not included in the above.

There are some very large estates in the last class, but with a very few exceptions 5000 acres is the limit. The average of all classes was under 50 acres. It is highest in the Upper Sind Frontier and lowest in the Sukkur District.

FULL AND RESTRICTED TENURES.

Excluding alienations, all land, whether standing in the names of zamindars, or of tenants paying revenue direct to the state, is held on one of three tenures. These are the full survey tenure and the restricted tenure, both derived from the Bombay Land Revenue Code of 1879 as amended by legislation of 1901, and the special tenure enjoyed by certain occupants in the Jamrao, Dad and Nasrat areas under Bombay Act III of 1899. The most important description, both in point of extent and value, is the full survey tenure, which declares the right of occupancy to be a

heritable and transferable property and entitles the occupant to the use and enjoyment of his holding in perpetuity subject only to the condition of his paying the land revenue. The same privileges, save the right of transfer, are conferred by the restricted tenure. It is on this tenure that new land, or land forfeited for the non payment of fallow-assessment, is granted to persons who would be likely to fall a prey to those arts of the money lender which are always operating towards the extinction of the hereditary landholder. The area of occupancies on the full survey tenure in the whole of Sind in 1903-04 was 74,90,190 acres, and on the restricted tenure 1,33,727 acres.

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COLONIZATION

The occupancies conferred under Bombay Act III of 1899 are of two kinds, namely occupancies granted to capitalists and occupancies granted to yeomen and peasants. In both cases the occupancy is limited to 20 years. It is neither transferable without sanction nor chargeable with a mortgage, and it is expressly protected against judicial attachment and sale. The occupant is debarred from employing labour recently drawn from other canals in Sind. A capitalist occupant is bound to construct a house on the land or in the village in which the land is situated and to reside therein himself, or to establish a competent member of his family or other person in the house; while the yeoman, or peasant, is required to build a house and settle permanently in the village. The capitalist is granted his occupancy on payment of a fee; the yeoman, or peasant, is exempted from this charge. The former is entitled after five years to purchase the full occupancy rights defined in the Land Revenue Code; the yeoman, or peasant, is allowed after the same interval to acquire by purchase the right of permanent occupancy on the restricted tenure. The purpose of this class of 20 years' occupancies is to colonize the prairie lands opened by certain new canals on the lines of the colonies on the Chenab Canal. The number of grants made up to the 31st July 1904 under Bombay Act III of 1899 is shown in the marginal statement. The average size of the capitalists' grants is 126 acres;

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grants made to yeomen average 155 acres and to peasants 36 acres.

District.	Capitalist's grants.		Yeoman. grants.		Peasant grants.	
	No.	Area.	No.	Area.	No.	Area.
		Acres.		Acres.		Acres.
Hyderábád ...	14	2,950	473	96,381	612	23,078
Thar & Párkar ...	177	21,077	857	109,194	901	31,241
Total ...	191	24,027	1,330	205,575	1,513	54,319

Classifying these occupancies in the manner adopted in regard to holdings under the Land Revenue Code, the tale is:—within 5 acres, 49 holdings; from 5 to 25 acres, 616 holdings; from 25 to 100 acres, 1,802 holdings; from 100 to 500 acres, 486 holdings; over 500 acres, 81 holdings.

In Sind the labour required for the cultivation of the land is paid in kind out of the produce (see Wages, Chapter VII). The share which the landholder receives varies with the nature of the services rendered by his tenants. In lift lands irrigated by the means of wheels the holder generally obtains one-third (plus any subsidiary claims under *lápo*): in flow lands, where the crop is brought to maturity with little labour and expense, the tenants are content to share equally with the holder.

ALIENATION.

Lieutenant-Colonel Haig's contribution to the old Sind Gazetteer may again be quoted on this subject.

"Under the head of Alienation are comprised:—

1. Jagirs.
2. Pattadaris.
3. Khairats or Charitable grants.
4. Garden grants.

When the province came under British rule a vast extent of land was found to be held in jagir. In the Hyderábád district the Collector estimated that 40 *per cent.* of the land was thus alienated. When the question of the terms under which succession to Alienations was to be regulated first came under consideration, it was decided to regrant all cultivated lands subject to a charge of one-fourth of their nett proceeds and resume all waste land, while lands originally granted for service—civil or military—were to be resumed on the death of the present incumbent. But it

was soon found to be necessary to make a distinction between the various Jagirs, and ultimately they were brought under the following classification and conditions of succession:— Land Revenue.

Class I.—Jagirs granted prior to the accession of the Talpurs (1783).

Class II.—Jagirs granted by the Talpurs up to the year 1810, the year in which Mir Ghulam Ali, the second of the four brothers, who were the first Hyderábád Mirs, died.

Class III.—Jagirs granted between 1810 and 1833, the year in which Mir Murad Ali, the last of the four brothers died.

Class IV.—Jagirs granted between the last mentioned year and the conquest by the British.

The following were the conditions of regrant:—

1st Class Jagirs.—To be continued undiminished and unassessed.

2nd Class Jagirs.—Two distinct sets of Jagirdars were recognised by the terms of succession under this class. 1st. The four great Talpur families of Shahdadani, Shahwani, Manikani and Khanani. A promise had been made by Sir Charles Napier, when Governor, to the representatives of these families to remit in consideration of their high position and reduced means the charge of one-fourth of proceeds on succession. This promise was observed, and instead of attempting to ascertain the exact extent of waste land prior to resuming it, it was decided to resume one-third of the Jagir waste lands in all cases. Under the circumstances this arrangement is very liberal to Jagirdars. The second set of Jagirdars, known as the "Sind Sardars," comprised a considerable number of persons of very various degrees of social position, and it was found that to apply the fixed rule (resumption of waste and charge of one-fourth of proceeds and cultivated land) in all cases would operate most injuriously to the interests of some of the well-descended among this class of Jagirdars, while it would be over indulgent to others of inferior status. Accordingly it was decided to settle succession in each case on its own merits, taking into consideration various circumstances of social position, rank, and influence, unfettered

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by any strict rule of proceeding, and the result of the Settlement was that about one-sixth of all the Jagir land held by the Sardars was permanently alienated.

3rd Class Jagirs.—To be regranted undiminished, but subject to payment of one-fourth proceeds, for one succession after the death of the incumbent at date of the battle of Meeanee.

4th Class Jagirs.—To lapse on the death of the incumbent at the date of the battle of Meeanee.

In Jagirs of all classes succession is strictly limited to lineal heirs male, and all are subject to a cess of 5 *per cent.* on account of local funds, also to the *hakábo*, or water rate, if they receive water from Government canals.

The Pattadari grants are confined to a very limited district, comprising portions of Shikárpur, Sukkur, and Naushahro Abro talukas situated in the tract of country formerly known as "Moghuli" and under the Afghan Governor at Shikarpur. These grants are in fact of Afghan origin. Settlers of that nationality having obtained from their Governments deeds (*pattas*) of reduced assessment on lands which they had purchased from Sindi proprietors, or reclaimed from the waste, were the ancestors of the present Pattadar." The Talpurs, when they had succeeded in ousting the Afghan Government from North Sind, recognised these grants, and they were confirmed by the British Government on the ground of "long enjoyment" The Pattadari has now become a rent charge, a fixed proportion of the revenue of certain lands being paid over by Government to the Pattadar." (The revenue alienated under this head amounted to Rs. 51,760 in 1900-01.) "The charitable grants require little notice. They are assignments to Saiyads, Fakirs and others of land, shares of revenue, money or grain, which length of enjoyment before the advent of British rule was held to be a proper ground for confirming." (The revenue alienated under this head amounted to Rs. 6,29,117 in 1900-01.)

"Garden grants comprise lands under garden cultivation held either free of assessment or on reduced rates under Sanads granted by former Governments or by our own. According to rules framed by Sir Bartle Frere, such grants are ranged under two classes :—

I.—Held without assessment.

II.—Held on the quarter ordinary assessment on garden land.

Land Revenue.

These grants are subject to the condition that the gardens are properly maintained. They are continuable to lineal heirs male and, provided the grantee complies with certain conditions, they may be mortgaged, sold or otherwise transferred."

There are two other minor alienations, namely, *huri*, or Tree Grants, and *seri*, or village Service Grants. Owing to the treeless character of the country Mr. Frere, when Commissioner in Sind in 1858, sanctioned the grant of land rent-free for growing trees. The concession, which is only a remission of revenue on certain lands so long as they are used only for the purpose of growing trees, has been continued and is transferable. If crops are cultivated on such lands they at once become liable to full assessment. The land thus granted amounted in 1900-01 to 3,850 acres. *Serí* grants were grants of land rent-free as payment for certain public services in connection with the prevention and detection of crime, &c. The office of the holder was not hereditary, but might be continued to his son. The Sind Village Officers' Act of 1881 having provided for the appointment of regularly paid village officers, the old *seri* grants are lapsing and the assessment on land now assigned for their services is debited to the village cess fund. The land granted under this head in 1900-01 was 10,017 acres.

Besides these ordinary alienations there are large tracts of land in the Upper Sind Frontier District granted rent-free to Baluch chiefs and their followers, some in perpetuity and others for life, on condition only of loyalty and good behaviour. They are liable to pay *hakábo* and any other legal cess. The land alienated under this head in 1900-01 was 26,100 acres.

OTHER REVENUE.

Other Revenue.

The revenue figures given in Tables XXII-A. and XXII-B. include, besides Land Revenue, that derived from Stamps, Income Tax, Excise, Local Funds and Other Sources. The last include some large and important sources of revenue, such as Customs, Salt and Opium, as well as comparatively unimportant and miscellaneous collections in various departments. Forest revenue, however, is not included in the Tables, as it cannot be shown by districts. Figures will be found in the article on Forests in Chapter II, and the small revenue derived from Fisheries is given in the B Volumes in connection with its proper subject. Local Funds are dealt with in the chapter on

Other Revenue.

Municipalities. The other principal heads are noticed below after Land Revenue.

STAMPS.

The Mirs had an excellent ordinance under which one-fourth of the amount which formed the matter of every civil suit decided by them was taken as a court fee. This restricted litigation effectually. Sir Charles Napier contented himself with 5 per cent. On the introduction of a more regular administration in 1859 the Indian Stamp Act came into operation. The revenue from stamps is at present regulated by Act II of 1899. Stamps used to be supplied from Bombay; but in 1905 a Central Stamp Depot was established at Karáchi for the supply of the treasuries in Sind, the Punjáb, North West Frontier Province and part of Rájputána. The total revenue realised from this source during the last ten years is shown in the margin. Details for each District will be found in Table XXV.

Year.	Revenue from Stamps.
	Rs.
1895-1896	6,76,257
1896-1897	6,66,000
1897-1898	6,68,305
1898-1899	7,30,163
1899-1900	7,87,261
1900-1901	7,15,137
1901-1902	6,58,332
1902-1903	7,40,914
1903-1904	7,19,647
1904-1905	7,03,079

INCOME TAX.

The total revenue realised from the Income Tax in Sind during the last ten years, inclusive of amounts recovered by the Accountant General in Bombay, is shown in the margin. The average number of persons assessed on their salaries in Sind was 816, but by far the greater part of the revenue was derived from companies, securities and other sources of income. Details for each district will be found in Table XXVI, but those figures do not include the amounts recovered by the Accountant General in Bombay on salaries pensions &c., nor the persons from whom they were recovered. The Income Tax is at present regulated by India Act II of 1886, as amended by Act XI of 1903.

Year.	Income Tax.
	Rs.
1895-96	3,75,009
1896-97	3,81,721
1897-98	3,87,101
1898-99	3,85,234
1899-1900	4,00,144
1900-1901	4,28,671
1901-1902	4,26,708
1902-1903	4,33,694
1903-1904	3,32,799
1904-1905	3,36,764

EXCISE COUNTRY SPIRITS.

Though the Mirs abhorred the mention of spirits and severely punished drunkenness about their courts, they were not averse to

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drawing a revenue from the forbidden article. This was raised by selling the monopoly of distillation to the highest bidder. The liquor was made from *gur*, or dates. For the use of the rich it was perfumed, or spiced, and wine was made from grapes at Hyderábád, Sehwán and Shikárpur. Under British rule the right to distil spirits and sell them within specified limits, but without restriction of any kind, continued to be sold by auction until 1887-88, when Mr. (afterwards Sir Charles) Pritchard, the great reformer of the Salt and Abkari Departments in Bombay, was Commissioner in Sind. In that year he took steps towards the introduction of the Bombay system. The privilege of manufacture was separated from the privilege of sale. Public distilleries were opened at Sukkur and Kotri, where license to distil was granted to all respectable applicants on payment of fees. All the spirit made by them was subject to duty at 3 or 4 rupees a gallon according to strength. At the same time separate shop licenses were issued for the wholesale or retail sale of country liquor at all the principal towns and talukas. The licensees were at liberty to supply themselves either from the public distilleries, or from outside the Province. The right to draw and sell toddy was also sold, but there was very little demand for it. The Abkari Report of the following year shows a very remarkable increase of the revenue under the new arrangements, the total realisations amounting to Rs. 4,62,947 against an average of Rs. 3,59,079 in the five years ending 1886-87. But it was found advisable to close the Sukkur distillery and no further advance was made towards the introduction of the Bombay system in its entirety. There has been little change since and the system, as it exists now, corresponds to the "Free-supply system" in force in Bombay. Under it manufacture is separated from vend and there is no monopoly of either. The country liquors sold are "mowra" spirit, obtained from the distilleries at Uran in the Presidency proper, and *gur* spirit distilled at the Central distillery at Kotri, which is under the management of the Collector of Hyderábád. This Distillery, which is of the same description as the central distilleries in Northern India, is supervised by a special establishment under an Inspector. The distillers licensed to manufacture liquor have each one or more stills, for which they are charged a fee of one rupee per gallon per year of the capacity of each still. The distillery buildings are the property of Government, but the plant belongs to the distillers.

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The number of separate licensed distillers was 8 in 1905-06 and the number of stills 23.

The strength of liquor allowed to be sold and the duty charged on each kind are :—

Strength.	Rate of duty.
Strong spirit :—From Uran 12° to 0° under-proof... From Kotri 4° to 8° under-proof...	5 0 0
Weak spirit :—From Uran 25° to 28° under-proof..	3 0 0
From Kotri 35° to 40° under-proof..	2 10 0

The consumption of Uran liquor is practically confined to the town of Karáchi. Liquor may be sold by distillers to shopkeepers at whatever price they can secure and the latter are free to procure their liquor either from Uran or Kotri, but must sell it at the strengths of issue noted above. With a view to facilitating the supply of liquor to retail licensees a few wholesale licenses are granted free of charge, but the retailers, who are selected by the Collectors and Deputy Commissioners for their Districts, pay fees varying from a maximum fee of Rs. 500 in the town of Karáchi to Rs. 6 in rural areas. The number of shops is fixed for each District by the Commissioner.

Maximum prices for sale to the public are fixed.

FOREIGN LIQUORS.

The duty on imported spirits &c. being credited to Customs, the excise revenue is derived from fees for the right of vend. Ordinary vend licenses are of three classes, importers, wholesale and retail licenses. Importers' licenses, which are granted only in the town of Karáchi, are issued to Firms doing a large business, and permit the sale of liquor in original packages in quantities of not less than 2 gallons at a time. Retail licenses are issued on payment of fees ranging from Rs. 500 to Rs. 700 and permit the sale of foreign liquor in any quantity, consumption on the premises being allowed. Wholesale licenses permitting the sale of liquor in quantities not less than a pint at a time and prohibiting consumption on the premises, are granted in all Districts on fees varying from Rs. 25 to Rs. 250. Licenses are also granted for the sale of liquors in hotels and refreshment rooms &c. in Karáchi, Hyderábád, Sukkur and Lárkána Districts at varying rates of fees.

As a rule foreign liquor is not sold at a strength of under 15° under-proof.

Shahjehanpur Rum and malt liquor manufactured by the Murree Brewery Company at Quetta are the only liquors of Indian manufacture excised at tariff rates that are imported into Sind. Their sale is confined to the large towns of Karáchi, Hyderábád and Sukkur. For admistrative purposes they are treated as "Foreign spirit" and are sold under licenses for the sale of foreign spirits, but the duty levied on them is an item of excise revenue.

Other Revenue.

There are no breweries in the Province. Seventy-five per cent of the population of Sind are Musalmans and the consumption of liquor is consequently chiefly confined to the Christian, Parsi and Hindu population; country liquor is drunk mostly by Amils, Banias and Goanese. The consumption of it is practically stationary. During the past decade it amounted to no more than 3 drams per head of population.

TODDY.

The consumption of toddy in Sind is very small, the little that is sold being consumed by immigrants from the south. No state-owned and only a few private date trees are tapped, the owners preferring to keep them for fruit. The right of tapping the trees and selling the produce is farmed out annually, the farmer making his own arrangements with the owners of the trees. There are nine shops authorised to sell Toddy, eight in the town of Karáchi and one in the town of Kotri in the Karáchi District. There is no restriction as to the price at which toddy may be sold. The tree tax system is not in force in the Province.

The administration of the Abkari Department in Sind is conducted by the district officers under the control of the Commissioner. Special Abkari Inspectors are employed for preventive work under the Collectors of Karáchi, Hyderábád and Sukkur, and the distillery at Kotri has a special establishment attached to it.

INTOXICATING DRUGS.

A note by Lieutenant Richard Burton and Assistant Surgeon Stocks, written in 1848, informs us that preparations of hemp (*Cannabis sativa*) were almost universally used by the lower orders in Sind at that time, being considered highly aphrodisiac, and that they frequently produced madness, delirium tremens, catalepsy and other diseases. The principal preparations were :—

Bhang, *Sukho*, or *Sawia*. The small leaves, husk and seeds of hemp, ground and mixed up with water, milk and other additions.

Other Revenue.

Gánjo.—The inflorescence of the hemp before the gum has been expressed; smoked in a water pipe till a peculiar contraction of the throat is felt.

Charas.—The gum of the hemp; rarely eaten, except when prepared as a sweetmeat, but smoked like Gánjo.

Until 1901 there was scarcely any restriction placed on these drugs in Sind, except that the right to sell them by retail was farmed out. In that year the cultivation of hemp was prohibited, excepting in *dehs* Búbak and Yákúbáni of the Lárkána District, and at the same time a quantitative duty was imposed on the drugs, whether manufactured in Sind or imported, at the following rates:—

Bhang ... 8 annas per ser.
Gánja ... Rs. 4 per ser.
Charas ... Rs. 2 per ser, raised on 1st April 1904 to Rs. 6 per ser.

Licenses are now granted for the cultivation of the plant, and when the *bhang* has been plucked and manufactured it is stored in a Central Warehouse established at Búbak, from which the retail and wholesale trade is supplied. The warehouse is in charge of an Inspector, whose duty, besides looking after the warehouse, is also to watch the *bhang* crop while it is being cut and generally to supervise the cultivation of the plant, the manufacture of the drug and its removal to the warehouse. *Gánja* is usually obtained from Panwel in the Colába district and *Charas* from the Government warehouse at Amritsar.

To facilitate the supply of drugs to retail shops wholesale licenses are granted to selected persons on payment of a fixed fee of Rs. 15, but retail dealers may if they choose make their own arrangements to obtain their supplies from the sources of supply instead of from the wholesale shop. The retail license for each shop is sold separately by auction to the highest bidders.

The maximum quantities of the drugs which can be sold to one and the same person on one day are as follows:—

Bhang or any preparation or admixture thereof... ¼ ser or 20 tolas.
Gánja and Charas or any preparation or admixture thereof ... ... 5 tolas.

For special occasions, however, such as marriages, permits are granted for the sale of larger quantities.

Intoxicating drugs are used by both Hindus and Musalmans and the consumption fluctuates with the price, the character of the harvest and the material condition of the people. The progress of popular education has had no material influence on the consumption of either liquor or drugs, one way or the other. The connection of Government with the manufacture and sale of liquor and intoxicating drugs in this Province causes no scandal in the public mind. Educated natives understand the principles on which our excise administration is conducted in India and the bulk of the people are indifferent about the matter so long as they obtain what they want.

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No new shop is opened unless the necessity for it is proved to the satisfaction of the Commissioner. A notice is previously published for the information of the residents and any objections which they may make are fully considered before the shop is opened. Local opinion is also consulted before the situation of any existing shop is changed.

The subjoined table shows the net revenue realised from the principal exciseable articles for the years 1887-1906.

Year.	Intoxicating Drugs.	Country liquor.	Foreign liquor.	Toddy.
	Rs.	Rs.	Rs.	Rs.
1887-1888 ...	1,14,830	3,78,353	11,387	521
1888-1889 ...	1,23,461	4,62,947	12,557	822
1889-1890 ...	1,37,490	4,84,343	15,193	981
1890-1891 ...	1,36,510	5,11,218	14,978	632
1891-1892 ...	1,41,635	5,64,336	14,530	638
1892-1893 ...	1,65,310	6,04,028	15,202	852
1893-1894 ...	1,81,375	6,75,119	16,864	882
1894-1895 ...	2,08,058	7,78,912	17,057	992
1895-1896 ...	2,18,772	8,43,305	17,237	1,205
1896-1897 ...	2,25,925	8,20,070	17,463	1,125
1897-1898 ...	2,50,325	8,16,899	16,419	900
1898-1899 ...	2,42,800	8,16,899	16,663	1,200
1899-1900 ...	2,79,200	8,34,835	17,158	925
1900-1901 ...	2,75,900	7,89,472	17,310	1,325
1901-1902 ...	2,53,430	8,46,166	19,110	1,425
1902-1903 ...	2 39,212	8,58,508	18,553	1,197
1903-1904 ...	2,37,695	8,57,876	18,330	1,020
1904-1905 ...	2,69,218	9,32,459	19,405	1,315
1905-1906 ...	2,86,317	9,52,321	19,961	980

The incidence of excise revenue per head of population for 1881, 1891 and 1901 was respectively, Re. 0-2-0, Re. 0-4-5 and Re. 0-5-5.

The imports into the Province of Sind of foreign spirits for the

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last five years are shown below :—

Year.				Gallons.
1901-02	...	...	...	667,062
1902-03	...	...	...	411,782
1903-04	...	...	...	601,173
1904-05	...	...	...	810,236
1905-06	...	...	...	977,923

These figures include imports for the Punjab and other ports of India. There is evidence that the consumption of deleterious cheap spirits from Europe is increasing. The question whether the sale of European liquor should not be more restricted is receiving the attention of the local Administration.

OPIUM.

The use of opium prevails throughout Sind, though it is said to have been much reduced since the heavy British duties were imposed on the drug. The average consumption per head now is ·22 of a tola. In Thar and Párkar, where the Rájput element predominates in the population, it is ·37 of a tola and in the Upper Sind Frontier only ·08. Before the conquest much opium passed through Sind from Rajputana and was exported from Karáchi in order to avoid the British duty in Bombay. The Mirs levied a transit duty of Rs. 200 per camel load on this and realised an annual revenue of about Rs. 1,00,000 from it. They also levied an excise duty on opium locally sold by means of licenses, or state contracts. A similar arrangement was continued for some time after the conquest, but afterwards abolished in favour of vendors' licenses sold at rates adjusted to the population of the place and the probable consumption. The licensees were allowed to purchase opium only from the Collector's stores, which were supplied from Jaisalmer direct, the cultivation of the poppy in Sind being prohibited. The revenue derived from this source in 1855-56 was Rs. 15,668. The introduction of Opium Act I of 1878, which imposed a duty on Málwa opium imported into the Bombay Presidency under passes and closed all other sources of supply, did not make much difference in the system of retail sale in Sind; but in 1880-81 the practice of requiring the farmers to guarantee a minimum vend was introduced. In 1890-91 some further changes were introduced, in conformity with the practice of other parts of the Presidency. Except in Thar and Párkár, farms were given for whole Districts instead of for Talukas as formerly, and the farmer's margin of profit, *i. e.* the difference between the issue

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rate at the Government depots and the contract selling price, was reduced from Rs. 10 to Rs. 2-8-0 per lb. From 1892-93 the farmers were required to contribute towards the cost of a supervising and preventive establishment instead of paying fees for vendor's licenses, while the clause in the contract which bound them under penalty to sell not less than a certain quantity was withdrawn. From 1900-01 the system was briefly this:—The monopoly of the sale of opium throughout the Province was given by the Commissioner to a selected farmer of means and respectability, who paid nothing for the privilege (beyond duty on the opium sold by him), but was obliged to contribute towards the cost of the establishment maintained to prevent smuggling. The price at which he might sell opium was subject to a fixed maximum and minimum and he might not sell more than a certain specified quantity to one person at one time. On the 1st of April, 1905, the "single shop" system was introduced, under which the right of retail vend is sold by tender separately for each shop. As this gives a fair chance to competition, the selling price is subject to no maximum limit, but the minimum limit remains. The cost of the preventive establishment is borne entirely by Government. For the convenience of the contractors under this system sub-depots for the issue of Government opium have been established at all Taluka headquarter towns. The issue rate is subject to variation: it was raised from Rs. 24 to Rs. 32 per *ser* at the beginning of 1905-06, but reduced to Rs. 29 again in March 1906. The average retail selling price was Rs. 40 under the former rate and Rs. 37 under the latter. The maximum quantity of opium which may be sold to one person at one time without a special permit is now 10 tolas in the Thar and Párkar desert and 3 tolas elsewhere. The revenue derived from opium during the 5 years ending 1905-06 was as follows:—

	Rs.
1901-02	1,31,004
1902-03	89,150
1903-04	1,25,945
1904-05	1,31,150
1905-06	2,06,144

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The consumption in each District during the year 1905-06 is shown below:—

District.	Population (Census 1901).	Total sales of Opium.	Rate of Consumption per head of population.
		Lbs.	Tolas.
Karáchi	446,513	3,398	·30
Hyderábád	963,210	5,737	·23
Sukkur	523,345	2,729	·21
Lárkána	656,083	1,824	·11
Thar and Párkar ...	389,714	3,640	·37
Upper Sind Frontier ...	232,045	439	·08

The preventive force of 3 Inspectors and 49 Head Constables now maintained specially for opium is to be merged in the combined Salt and Excise establishment mentioned under Salt further on. Offences against the Opium Act are few and trivial, if importation at Karáchi from the Persian Gulf, which is dealt with by the Custom House, be excluded.

CUSTOMS.

Soon after the conquest all transit and internal customs duties were abolished. Customs duty is now collected only on goods imported or exported by sea, and such importation and exportation are allowed only at Karáchi and the two subordinate ports, Keti and Sirganda. From a Customs point of view Karachi had become important more than a century ago. In 1809, when the British Mission under Mr. Smith came to Karáchi, the customs duties levied there were estimated at Rs. 99,000, and in 1838 they had risen to Rs. 1,50,000. The rapid expansion of the trade after the conquest is described in Chapter VIII. The expansion of the customs revenue did not correspond with that of the trade because it was affected by changes in the fiscal system. For the first fifteen years the duties were very light and the total realisations ranged from Rs. 26,799 to Rs. 95,309. In 1863-64 they had risen to Rs. 4,16,376 at Karáchi alone and in 1873-74 they had fallen again to Rs. 3,37,865. In 1881 import duties generally were abolished, but on 10th March, 1894, they were re-imposed Customs duty is now levied on most articles imported from

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foreign countries, with certain prominent exceptions, among which are books and printed matter, steam machinery and railway materials when imported by a railway company. A refund, or "drawback," of $\frac{7}{8}$ of the import duty is allowed on goods re-exported within two years, under stringent conditions relating to identification. Arrangements exist, similar to those in the English Custom House, for permitting spirits &c. to be retained in bond for reshipment without payment of duty. Rates of duty are regulated by the Tariff Act, the Schedules appended to which are amended from time to time. Import duty ranges from 1 to 5 *per cent.*, assessed usually on the market value, or on the "tariff value," which is a fixed value based on averages and avoids much trouble in certain classes of goods; but sometimes on weight or quantity. Tariff values are revised periodically. Wines and spirits are subject to special rates of duty per gallon, and on arms imported for their own use by persons entitled to possess them the rate has always been 10 *per cent.* on market value. If otherwise imported, a heavy duty independent of value (Rs. 50 for each gun &c.) is levied at the time of importation, but the difference is refunded on proof of sale to a person entitled to possess. The exemption from duty of passenger's baggage depends on rules issued from time to time by the Government of India. There is no export duty except one of 3 annas a maund on Rice, which has existed for a very long time.

The gross amount realised in Customs duties at Karáchi, Keti Bandar and Sírganda during the last decade is shown below, and also the amounts on certain principal articles.

Ports.	1895-96.	1896-97.	1897-98.	1898-99.	1899-1900.	1900-1901.	1901-02.	1902-03.	1903-04.	1904-05.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
			Import	Duty, Exclu	ding Duty	on Salt.				
Chief Port—Karachi ...	22,16,765	23,27,509	27,02,204	22,11,478	27,39,737	37,03,353	52,62,392	38,15,644	33,28,398	39,26,765
Subordinate Port, Keti Bandar	197	194	172	222	118	109	126	36	71	138
Subordinate Port, Sirganda	162	219	343	178	294	301	198	233	113	161
Total Import Duty ...	22,17,124	23,27,922	27,02,719	22,11,878	27,40,149	37,03,763	52,62,716	38,15,913	33,28,582	39,27,064
				Export	Duty on	Rice.				
Chief Port, Karachi... ..	33,559	17,145	50,852	1,22,227	77,390	85,770	1,64,138	1,13,522	1,24,173	1,43,971
Subordinate Port, Keti Bandar	12,108	17,742	23,106	19,143	16,822	13,929	13,688	7,388	5,389	17,075
Subordinate Port, Sirganda	22,589	26,496	20,007	27,451	22,074	24,220	30,809	22,226	23,397	27,871
Total Export Duty ...	68,256	61,383	93,965	1,68,821	1,16,286	1,23,919	62,08,635	1,43,13	1,52,959	1,88,917

From these figures must be deducted the amount paid annually in Refunds and Drawbacks, as follows :—

Province of Sind.	1895-96.	1896-97.	1897-98.	1898-99.	1899-1900.	1900-1901.	1901-02.	1902-03.	1903-04.	1904-05.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	R
Refunds and Drawbacks on Articles Imported ...	34,693	55,471	39,863	28,559	48,734	1,54,006	2,92,940	6,50,308	95,305	27,157
Refunds on Rice Exported.	...	153	223	219	468	87	139	1,475	323	608

Amount of Import Duty collected on some principal articles :—

Articles.	1895-96.	1896-97.	1897-98.	1898-99.	1899-1900.	1900-1901.	1901-02.	1902-03.	1903-04.	1904-05.
	Rs.	Rs,	Rs.	Rs.	Rs-	Rs.	Rs.	Rs	Rs.	Rs.
Liquors...	6,05,949	5,48,110	6,39,730	6,63,531	6,33,062	6,48,397	6,95,122	7,85,143	7,98,930	7,97,861
Sugar	2,81,042	3,71,828	4,71,715	3,37,069	7,87,285	16,96,616	26,51,928	12,95,307	6,65,239	6,64,542
Petroleum, Kerosine, &c. ...	97,876	1,50,295	3,03,540	83,634	1,39,475	2,45,224	2,50,681	2,14,132	2,98,469	2,68,164
Apparel...	32,837	32,339	34,723	43,953	40,757	58,626	48,965	57,370	61,018	83,254
Cotton Piece-goods	6,04,088	7,02,428	6,62,075	5,81,989	6,61,624	6,01,869	10,27,459	7,81,851	7,01,862	11,79,420
Woollen Goods	20,145	32,107	28,890	41,913	57,303	67,560	1,02,197	50,339	1,01,061	1,92,552

The Customs Department is controlled by a Chief Collector of Customs, with two Assistants, who all have their offices in the Karáchi Custom House, where there is also a large establishment of Inspectors concerned with the examination, weighment &c. of goods, Appraisers, who appraise goods for duty, and Clerks, Gatekeepers &c. A strong staff of Preventive Officers is on duty night and day at Kiámari and Manora. It is their function to see that no goods are unauthorisedly landed or shipped.

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SALT REVENUE.

The native rulers in Sind, as in other parts of India, claimed a share in the profits of salt manufacture, which they took under the name of *batai*; but the revenue which they derived from this source is not known. When the Province came under British rule the *batai* was abolished and salt remained entirely untaxed until 1848, when certain native speculators obtained permission to excavate and export salt from the vast Sirganda deposits (see description under Mineral Products) on payment of a duty of 12 annas per Indian maund, which was then the rate of excise duty in Bombay. This was to be refunded if the salt was imported. This trade was afterwards carried on for some time by the Karáchi Salt Company on the same terms. But this tax was purely an export duty. It was not until 1861 that the Government of India suggested the imposition of a duty on salt consumed in Sind. After some discussion as to methods the "license" system was adopted. It was declared contraband to open any salt-work without a license, one condition of which was that a duty of 8 annas should be paid on every maund of salt removed. The same was levied on all salt imported from neighbouring States. The machinery provided for recovering this duty consisted of a Munshi on pay ranging from 15 to 25 rupees, assisted by two peons on from 5 to 7 at each place where manufacture was licensed. There were at this time three sources of supply in Sind, *viz.*,

1. Excavation of natural deposits.
2. Manufacture from *kalar*, or salt earth.
3. Manufacture from brine wells.

The Political Agency of Thar and Párkar was almost entirely supplied from the numerous salt lakes in that region, and the southern part of the Karáchi and Hyderábád Districts from the deposits in the Játi, Sháhbandar and Badin Talukas, while manufacture from brine wells was carried on in the Moach plain near Karáchi; but throughout the rest of Sind salt made from *kalar* was in use. The process of manufacture cannot be better described than it was by Mr. A. O. Hume in a paper on a very different subject, namely, the Ornithology of Sind, published in 1873. ("Stray Feathers," Volume III) "Conceive a huge level field, as white as snow from saline incrustations, the refuse of the manufactory, on which were arranged between three and four thousand clumsy, thick, unglazed, earthenware saucers, from 2 to 3 feet in diameter,

about 6 inches deep, ranged in double rows with great regularity, round a small tank of brine about 20 by 30 and about 6 or 8 feet deep. Out of the tank the brine is painfully ladled in buckets and evaporated in the saucers, each saucer turning out about 24 crops in the year, and producing during this period from 80 to 100 lbs of salt. The brine tank is filled by a duct leading from a rough filter, which is an enclosure of mud walls, roofed at about 3 feet from the ground, the roof made of beams covered thickly with tamarisk boughs. On the top of this earthy scrapings of the saline efflorescence that abounds in the immediate neighbourhood are heaped to the depth of some 3 or 4 feet, lixiviated with water (somewhat brackish) raised by a Persian wheel, and the brine thus generated drips slowly through the roof and runs into the tanks, where it is allowed to settle and concentrate for a few days before it is used. The washed earth is removed from the filter and a fresh charge introduced as soon as may be necessary."

When it was declared contraband to manufacture salt without a license, excavation was included in manufacture and no one was permitted (theoretically) to remove salt from a natural deposit until he had paid 8 annas a maund for the quantity that he required. A Munshi and peons as above, without supervision of any practical kind, gave or withheld the permission. What the Munshis gained under this system must be left to the imagination. What Government lost was estimated in 1872 by Sir William Merewether, then Commissioner in Sind, at about one-third of the legitimate revenue. In that year the Government of India had called for a report on the existing system, with proposals for its improvement, and had lent the services of Mr. R. H. Whitten, Collector of Inland Customs at Agra, to assist the Commissioner. In a very full and able report that officer exposed the rottenness of the existing system and proposed two schemes for supplying all Sind with excised salt under efficient safeguards. He strongly urged at the same time that the duty should be raised to the Bombay rate of Rs. 1-13-0 per maund. This was opposed by one or two district officers, but supported by Colonel Dunsterville, the popular Collector of Shikárpur, who recorded his conviction, after nine years' consideration of the subject, "that we ought in the interests of the Indian public to raise the excise duty on salt, and that we can do so without imposing any grievious burden on

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the people." Sir W. Merewether also pointed out that, even at the higher rate of duty, the "burden" would amount, for each individual, to 4 annas 8 pies per annum, and that the poor, who buy salt in very small quantities at a time, would be positively ignorant of its existence. One of Mr. Whitten's alternative schemes was adopted, with slight modifications, by a Committee consisting of the Collectors of Karáchi and Hyderábád, and submitted to Government by the Commissioner under his No. A/3108 dated 28th October 1872, together with a draft Act for carrying it into effect. Up to this time the levy of an excise duty on salt in Sind had been without any legal warrant!

The essential features of this scheme were:—

To prohibit entirely both manufacture and importation from foreign states and to prohibit removal from natural deposits excepting at authorised places and by authorised persons, granting reasonable compensation to salt manufacturers (*lunáris*) thus deprived of their ordinary means of livelihood.

To have an "authorised place" at Sirganda, or on the Moach plain, and another, if necessary, in Thar and Párkar, with sufficient supervising and preventive establishments.

To allow traders to remove salt from these places on production of permits from the Collector of the District certifying to the payment of Government dues.

To establish Depôts at Karáchi, Hyderábád, Sehwán and Sukkur, where a large stock of salt should be kept and issued to traders under the same conditions.

To fix a uniform selling price of Rs. 2 per maund to cover duty and cost.

To place the whole Department under an Inspector of Salt Customs on an adequate salary (Rs. 800 a month was suggested.)

A force of from twenty to thirty peons and mounted patrols on pay ranging from Rs. 7 to 20, under Superintendents on Rs. 50 or 60, was provided for the prevention of smuggling and illicit manufacture in each District.

No action followed on these proposals until 1877, when Sir Richard Temple, Governor of Bombay, being on a visit to Karáchi, convened a meeting of the local authorities, with Mr. (afterwards Sir Charles) Pritchard, Collector of Salt Revenue in Bombay, and

disposed of the matter in G. R., R. D., No. 7613, dated 12th December 1877, which placed the administration of the salt revenue in Sind on its present footing, following the lines of Mr. Whitten's scheme with one important difference, *viz.*, that the railway, instead of the River Indus, was made the channel for the distribution of salt. By G. of I. Notification No. 263, dated 28th December 1877, a duty of Rs. 2-8-0 was imposed on salt throughout Sind from the 1st of January following and manufacture without a license was prohibited. Within a month Mr. A. G. Maury, of the Bombay Salt Department, arrived and proceeded to lay out the saltworks on the Moach plain* afterwards called by his name, at which, in the course of the next official year, 115,251 maunds were made. Of this quantity only 25,059 maunds were sold that year, there being old stocks on hand in the country and old saltworks still in use. In the following year Mr. Maury was able to report the closing of all the old salt factories in Sind, and the sales at Maurypur rose to 74,766 maunds. In 1880-81 they amounted to 120,241 and since that time the entire Province has been practically supplied from this source, with the exception of Thar and Parkár and a portion of the Hyderábád Collectorate. To supply these regions, far from the line of railway, Depots† were established at two large natural deposits, one at Dilyar in the Khipro Taluka, and the other at Sáran in the Diplo Taluka of the Thar and Párkar District. A certain quantity of rock salt is also imported from the Punjáb and sold in most towns, to meet the taste of Punjabi residents and for use in medicine, but the quantity does not average more than 10,000 maunds in the year. This is admitted free, having paid duty at the place of production. At the end of 1883 a Depôt for the sale of Maurypur salt was opened at Sukkur to foil the Banias, who took advantage of every occasion on which the railway was breached to run salt up to famine prices. This had the immediate effect of bringing down the price of salt at Sukkur by from 5 to 8 annas a maund. The Assistant Commissioner of Salt Revenue wished to have many such depots, but the Government of India refused sanction and directed that the "through booking" system should be introduced. Accordingly notices were issued fixing the price of salt at the various railway stations

* See B Volume, Karáchi District.

† See B Volume, Thar and Párkar.

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and intimating that any quantity would be sent direct from Maurypur on production of a receipt from any treasury showing that excise duty and other charges had been paid. Advantage was not taken of this concession and up to this time all northern Sind supplies itself from the Sukkur Depot, while the merchants of the Hyderábád and Karáchi Collectorates obtain salt through contractors at the works.

When Mr. Whitten wrote his report, in 1872, the total quantity of salt on which duty was realised in Sind was 124,338 maunds, which, with a population of two millions, indicated a consumption of about 5 lbs. per head per annum. In 1904-05 the total consumption of licit salt was 321,996 maunds, which, with a population of 3,210,910, gives 8·25 per cent., probably as high a rate as can be expected in a country in which the water that the majority of the people drink is more or less brackish. The rate in each District is not exactly ascertainable, but it is probably below the average in the desert tracts and above it in the more fertile. The wholesale and retail prices of salt in each District during 1901-02 (the last year in which the duty remained at the same rate throughout the twelve months) are given below :—

District.	Wholesale price per Indian maund.						Retail price per Indian maund.					
	From			To			From			To		
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Karáchi	2	11	7	3	8	0	3	4	8	3	15	4
Hyderábád	3	0	6	3	8	0	3	1	0	4	0	0
Lárkána	3	4	0	3	12	0	3	5	4	4	8	0
Sukkur	3	4	9	3	13	11	3	8	11	4	2	0
Thar and Párkar. ...	3	0	0	3	10	0	3	2	0	3	13	8
Upper Sind Frontier.	3	7	0	4	0	0	4	4	0	4	8	0

The price at the Maurypur Saltworks and Dilyar and Sáran Deposits was Rs. 2-9-6 : the difference between this and the local price measures the cost of carriage, vendor's profits &c. The price at the Sukkur Depot was Rs. 3-1-0 per maund, the Railway freight from the works being added to the selling price there. The price has been reduced with the reduction of duty since 1902 and is now Rs. 1-9-9 at Maurypur. Of this amount the duty is Rs. 1-8-0 and the balance represents cost price, storage and establishment charges.

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The amount realised under Salt Revenue during the past five years is shown below and also the cost of collection. The decline in revenue is explained by the reduction of the duty from Rs. 2-8-0 to Rs. 2 per maund in March 1903 and again to Rs. 1-8-0 in March 1905:—

Year.	Realisations.	Cost of collection.
	Rs.	Rs.
1901-02	7,50,309	1,34,873
1902-03	7,79,608	1,40,231
1903-04	6,29,362	1,34,358
1904-05	6,96,431	1,37,257
1905-06	5,83,149	1,35,032

Since 1882 the Salt Department has been controlled by a Collector of Salt Revenue, who is also Chief Collector of Customs. As his duties in the latter appointment make it difficult for him to exercise effective supervision over the preventive force distributed over the Province for the prevention of smuggling, the latter has been put under the orders of the Collectors of the Districts, who have also been appointed Collectors of Salt Revenue for specific purposes connected with the detection and punishment of offences. The results of this dual control have not been satisfactory and a scheme for a reorganisation of the Department in pursuance of the report of the Salt Committee appointed by the Government of India, F. and C. No. 4844, dated 11th August, 1903, is now under the consideration of Government. If it is sanctioned, the administration of that department will be under an officer directly subordinate to the Commissioner in Sind, with the designation of Assistant Commissioner of Salt Revenue, who will also control an efficient preventive establishment formed by the amalgamation and reorganisation of the separate forces now employed in connection with Salt, Excise and Opium. It is also contemplated to include in his jurisdiction the strip of Kalat territory marching with the Upper Sind Frontier which has been leased for administrative purposes by the British Government and is known as the Nasirabad Sub-division of the new Sibi District. Another result

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of the report of the above-mentioned Committee has been the abolition from the present year (1906) of all restrictions on the sale of salt. Formerly it could only be sold by licensed vendors, which was regarded by the Salt Department as a valuable safeguard against the dissemination of illicit salt.

CHAPTER X.

JUSTICE.

TABLES XVI, XVII, XVIII, XIX, XX AND XXI.

CRIMINAL JUSTICE.

Criminal Justice.

HISTORY.

The methods of justice under the Mírs have been briefly described in Chapter III, where an account is also given of the system of military courts instituted by Sir Charles Napier. This continued until the beginning of 1849, when regular tribunals were established and cases ordered to be disposed of according to the spirit of the code of 1827. The criminal courts were presided over by the Commissioner in Sind, who was given a Judicial Assistant, by the District Magistrates and the Deputy Magistrates. Two years later the Kárdars (the present Mukhtyarkars) were invested with criminal jurisdiction. The ordinary powers of a Kárdar authorized the infliction of a fine of Rs. 15 or imprisonment for 20 days; but he might be empowered to pass sentences of fine up to Rs. 100, of imprisonment for 4 months and of flogging not exceeding 25 stripes. Authority was also given to Kárdars' Head Munshis to exercise jurisdiction during the absence of their superior. Deputy Magistrates were empowered to inflict, without confirmation, punishments of one year's imprisonment, fine and flogging, and subject to the Commissioner's confirmation their sentences might extend to seven years' imprisonment. Extra Assistant Magistrates held the same powers as a Deputy Magistrate exercised without confirmation. The District Magistrate was invested with power to pass sentences of seven years' imprisonment without confirmation, or for a longer term subject to the Commissioner's confirmation. Every sentence of death or transportation for life required the sanction of Government. The combination with executive duties of work now disposed of by the Court of Session soon proved impracticable and in 1855 a Judicial Deputy Magistrate holding powers coextensive with those of the District Magistrate and exercising purely judicial functions was appointed in each District.

Criminal Justice.

The administration of criminal justice was placed on a more satisfactory footing by the enactment of the Indian Penal Code (Act XLV of 1860) and the Code of Criminal Procedure (Act XXV of 1861), the provisions of which came into force in the province on January 1st and November 1st, 1862, respectively. Under the latter statute the jurisdiction of the magistrates was curtailed and a Court of Session constituted for the trial of important cases, the Judicial Deputy Magistrate giving place to a Sessions Judge. The authority of the District Magistrate, or other magistrate invested with full powers, was limited to the infliction of two years' imprisonment with fine: a First Class Magistrate was empowered to award imprisonment for six months and a Second Class Magistrate for one month. In 1866 the criminal jurisdiction of the Commissioner in Sind, who had hitherto continued to exercise the functions assigned by the Code of Criminal Procedure to a Sadar Court, ceased and the office of Judicial Assistant was abolished on the appointment under Bombay Act XII of 1866 of a Judicial Commissioner to preside over the Sadar Court of Sind and to superintend the judicial administration of the province. The law regulating the procedure of the criminal courts was consolidated and amended by Act X of 1872, which substituted for the designations of magistrates introduced by the earlier code those of First, Second and Third Class Magistrate respectively. Increased administrative powers were also conferred on magistrates in charge of Divisions of Districts. Amendments to the Code of Criminal Procedure have since been promulgated, but the constitution of the courts established in the districts has undergone no material change.

JUDICIAL COMMISSIONER'S COURT.

An important change has, however, been introduced in the principal court of the Province by Bombay Act I of 1906, which came into force on 25th June 1906. In place of the Sadar Court and the District Court, or Court of Sessions, of Karáchi, there is now a Court called the Court of the Judicial Commissioner, which is the highest Court of Appeal in civil and criminal matters in the Province and also the District Court and Court of Session of Karáchi. It consists of three (or more, with the sanction of the Government of India) Judges, of whom one is the Judicial Commissioner and the others are Additional Judicial Commissioners. Of the latter, one must be a barrister of not less than 5 years' standing. Each of the Judges has all the powers and exercises

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all the jurisdiction of a Judge of a District Court and Sessions Judge within the Karáchi District. All appellate or revisional jurisdiction, other than that of a District or Sessions Court, is exercised by a Bench of not less than two Judges. In the event of their disagreeing, the appeal or case is referred by the Judicial Commissioner to the third Judge or to a Bench consisting of three Judges. The Bombay High Court has no jurisdiction in or over Sind excepting as regards (1) its powers under the Administrator General Act, 1874, (2) decrees in matrimonial cases and (3) European British subjects. Like the District Court of Karáchi before, it is a Colonial Court of Admiralty.

OTHER COURTS.

Subordinate to the Court of the Judicial Commissioner there are now the following Criminal Courts in the Province.

Court of the	Powers.
Sessions Judge.	Any sentence authorised by law; but sentence of death is subject to confirmation by the Court of the Judicial Commissioner.
Additional Sessions Judge..	Ditto ditto ditto. with respect to cases made over to him by the Sessions Judge.
Assistant Sessions Judge ...	Any sentence authorised by law, with respect to cases made over to him by the Sessions Judge, except a sentence of death or of transportation or imprisonment for a term exceeding 7 years.
First Class Magistrate ...	Imprisonment for a term not exceeding 2 years. Fine not exceeding Rs. 1,000. Whipping. (The District Magistrates of Thar and Párkar and Upper Sind Frontier Districts have the powers of an Assistant Sessions Judge and can take cognizance of offences themselves).
Second Class Magistrate ...	Imprisonment for a term not exceeding 6 months. Fine not exceeding Rs. 200. Whipping if especially empowered.

Criminal Justice.

Court of the	Powers.
Third Class Magistrate ...	Imprisonment for a term not exceeding one month. Fine not exceeding Rs. 50.

Three Public Prosecutors are maintained in the Province. Their emoluments are drawn from a fixed salary and fees.

In each District the Collector, or Deputy Commissioner, is the District Magistrate and the Assistant and Deputy Collectors in charge of divisions of the District are Sub-divisional Magistrates. These are First Class Magistrates. The officers in charge of Talukas and their Head Munshis are also Magistrates in their own charges, with such powers as may be conferred on them. Where there is too much work for these, additional "Resident Magistrates" are appointed of the same rank as Mukhtyarkars. Besides these there are City and Cantonment Magistrates and a Harbour Magistrate and Special Magistrates who are Honorary Magistrates appointed by the Commissioner. A list of the Criminal Courts in each District is given in the B Volume pertaining to it. It may be mentioned here that there are two Courts of Session in the Province besides that of the Judicial Commissioner, one at Hyderábád, having jurisdiction over the Hyderábád and Thar and Párkar Districts, and one at Sukkur, having jurisdiction over the Sukkur, Lárkána and Upper Sind Frontier Districts. The Sessions Judge, Sukkur and Lárkána, has an Additional Sessions Judge and the Sessions Judge, Hyderábád, has an Assistant Sessions Judge, who try such cases as the Sessions Judges may assign to them.

Appeals from the decisions of Magistrates of the Second and Third Classes are heard by the District Magistrate and by Sub-divisional Magistrates when specially empowered; but appeals from the sentences of First Class Magistrates and Assistant Sessions Judges lie to the Court of Session. From the Courts of Session and from the Court of the Additional Sessions Judge appeal lies to the Court of the Judicial Commissioner.

Under the Sind Frontier Regulation No. III of 1892 the action of the ordinary Criminal Courts can be suspended in all the frontier Talukas of Sind from Kohistán to Kashmor whenever it appears to the District Magistrate inexpedient that any case of an offence punishable with death or transportation for life should

be tried by a Sessions Court. In such cases he is authorised to refer the question to the decision of a Council of Elders, and to sentence the culprit, if convicted, to fine or to transportation for a term not exceeding 7 years.

Criminal Justice.

WORK OF CRIMINAL COURTS.

Tables XVI and XVII give a birdseye view of the work done by the Criminal Courts in the different districts in the years 1903-1905. The work of the Sadar Court during the same period is exhibited below :—

Description of work.	No. of cases disposed of in		
	1903.	1904.	1905.
Reported Cases	38	42	47
Criminal Revision otherwise than on application.	312	113	111
Criminal Revision on application	89	101	99
Confirmation Cases	11	23	15
Cases referred under Section 307 and 341 Criminal Procedure Code (V of 1898).	1	1	1
Criminal appeals	104	105	95
Total ...	555	385	368

A comparison of the work of the three Sessions Courts, as set forth in Table XVII, brings out some interesting differences. In Karáchi more than $\frac{7}{10}$ of all the persons tried by the Sessions Court are appellants from the sentences of lower courts, and in Hyderábád the proportion is nearly the same; but in the Upper Sind Frontier the number of appellants is less than the number tried in original cases. Similary in the Upper Sind Frontier and also in Thar and Párkar applications to the Court of Session for revision are almost unknown, while they are particularly numerous in Karáchi.

CRIMES.

With respect to criminality Sind suffers by comparison with the rest of the Presidency. In 1905 the proportion of true cases of cognizable offences worked out to one crime for every 444 of the population, the figure for the Presidency being 1 to 701. There has been a marked increase in crime during recent years, and even in serious crime. The proportion of undetected crimes has also increased, while the proportion of convictions to cases in the

Criminal Justice.

courts has declined. These facts appear to deserve note on the eve of a general re-organisation of the Police, to the inadequacy of which they are ascribed. The offence which brings the largest number of persons before the magistrates is theft, which includes cattle-lifting. This is classified by us as a crime, but was in former times regarded as an honourable enterprise for a man of spirit; and this view is not extinct yet, for the injured party often treats the matter as one for private settlement in preference to invoking the law. Crimes of violence are common, especially in the Sukkur and Lárkána Districts, which are infested by lawless Baluchis. During the three years 1903-1905 there were 205 persons convicted of murder or culpable homicide. In cases of this nature in Sind *Cherchez la femme* is a first principle of Police procedure: of the 65 murder cases tried in 1905 motives connected with women were assigned in 34. Dacoity and robbery with violence are kept in check by the application of Chapter VIII of the Criminal Procedure Code to known bad characters and Bombay Regulation XII of 1827 to turbulent or criminal communities. "Maliciously false complaints" occupy a prominent place in the Annual Police Report. Among the Districts, Karáchi leads in "Offences against public tranquillity"; but these are mostly street brawls of a petty character occurring among the lower elements of a very mixed population. Karáchi has been described, with some truth, as the Port Said of Sind.

CRIMINAL TRIBES. HURS.

Professional crime is practically non-existent in the Province and there is only one criminal tribe, namely the *Hurs*, or *Lurs*. This is not really a tribe at all, but a Union, or Brotherhood, among the followers of the Pír of Kingri, a village near to Rohri. This Pir claims descent from one Sayad Shah Ali Makhi, who accompanied Muhammad Kasim to Sind in 711 A.D. and settled first at Laki, where he took to wife the daughter of a Hindu Sahta converted to the faith. He was prolific and in time one of his numerous descendants settled near Mari and Shah Jario in Khairpur territory. From him came Pír Muhammad Rashid, who excelled all that had been before him in sanctity and multiplied his disciples exceedingly, especially in the Nara Valley. This man had 13 sons and at his decease they fell out on the question of the succession to the turban of Pírship. Pír Sibghatulla, the nominee of the father, secured the allegiance of the bulk of the disciples in the Nara Valley, and, on the occasion of one of his brothers attempting to shoot him, they resolved that they would

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never again do reverence to, or acknowledge, any relation of his. In short they would recognise no claim to obedience, or even respect, except that of the *Págáro* Pír to whom the turban had descended by nomination. For this loyalty Sibghatulla gave them the name of Hur walad Yazid Abtaha, who came over to the side of the Imam Husain at the battle of Karbala and died for him; and they took the name as a sacred distinction. But other Musalmans, abhorring their crimes, have transmuted the name to *Lur* (*i. e.* unholy) and both are current. The son of Sibghatulla was Pir Aligohar Shah, who was an intimate friend of Mir Ali Murad and prompted, or assisted, the forgery in the *Koran* by which he added largely to the extent of his territories at the time of the British conquest. But afterwards enmity arose between them and Pir Aligohar gave the information which led to Mir Ali Murad being deprived of his territories for the said forgery. This holy man was buried at Kingri, where his tomb became a place of pilgrimage, and left a son like himself by name Hazbullah Shah, who contrived to get himself twice tried in British courts on charges of murder. On the second occasion the murdered man was his own nephew, Pir Fazlullah Shah, the "Flag Pir" of Jhandewaro's Got in Hala Taluka, whose reputation for sanctity had drawn away a portion of the followers and the revenue of Pir Hazbullah. He was acquitted for want of evidence, but one of his *Hurs* was hanged. At this time he had a famous *Khalifa*, or Minister, named Wariam, to whose teaching many of the most blasphemous doctrines of the *Hurs* are attributed, and who seems to have been mainly instrumental in organising them into a fanatic sect pledged to absolute devotion of body, soul and estate to the ruling Pir and hostility, positive or negative, to the rest of mankind. They adopted a dress of dark green (*mongo*) and a peculiar *pagri* and refused to salute with the right hand, or the voice, any man except the *Pir*. Brother *Hurs* were to be saluted by folding the arms over the chest. This sect was first brought into conflict with the authorities through the murder of one of the *Pír's Khalifas* named Elias Kirio by one Darya Khan, a chief man among the *Hurs* and a friend of Wariam. He was arrested, but escaped and joined Wariam and his followers in the Makhi *dhand*, where he lived the life of an outlaw for 23 years, committing many murders and outrages. In 1888 another *Khalifa* named Chutal Khan was murdered, in connection with which crime Wariam, his son

Criminal Justice.

Bachu and one Piru were wanted by the Police. Wariam died, whereupon Bachu became the leader of the band, which was swelled by the accession of a few other outlaws. He made his head-quarters in the Makhi *dhand*, where he was held in reverence as the *Khalífa* of the Pir, a reverence which was apparently enhanced by his connection with the murder of a rival *Khalifa*. The *dhand* is a great depression, measuring about 12 miles by 10, situated in the heart of the Sánghar Taluka, where the Mithrao Canal takes off from the Eastern Nara. During the inundation it is flooded, and when the waters subside it becomes a mixture of marsh and dense jungle. During the cold season thousands of cattle find pasture in it and the herdsmen are *Hurs* to a man. To the south of it is another area of equal extent swept by floods passing outside the protective *bands* of the Nára, in which there is some cultivation and much jungle. To the south and west is the Sinjhoro Taluka, which at that time was part of the Sakrand and Shahdádpur Talukas of the Hyderábád District, and the Zamindars of which were mostly *Hurs*. Here Bachu and his band lived in perfect security, growing in power and influence, until he was emboldened to commit two desperate dacoities in the Khairpur State, in which he is said to have carried off a lakh of rupees. Other dacoities followed and the efforts to capture the perpetrators of these led to vindictive outrages. In February, 1893, a Police Naik who had been too zealous was shot down, with two of his men, as he sat outside the village of Bahrambari. Mr. Steele, the Deputy Commissioner, was indefatigable in his efforts to hunt down the gang and once nearly caught them, but the whole population was with them, excepting the Banias and a few respectable people who could help the authorities only at the peril of their lives. In October, 1895, when Mr. Steele's health broke down and Mr. W. H. Lucas was appointed to act for him, he found the whole country terrorised, the respectable zamindars not daring to move about without escorts and the Hindu *pancháyats* of all the large villages compelled to pay heavy subsidies. "Badshah" Bachu, his "Wazir" Piru and others openly paraded the roads in arms. Mr. Lucas tried new methods. The Makhi *dhand* was cleared of graziers, unauthorised settlements were swept away and the inhabitants compelled to live under observation, punitive Police were settled on villages and everything was done to make the lives of the *Hurs* unbearable. At the same time three companies of the

1st Baluchis and the Sikh Squadron of the 6th Bombay Cavalry from Jacobabad were employed to surround and harry the Makhi *dhand.* All proved futile until Sir Charles Ollivant brought special pressure to bear on the *Pír* of Kingri, who was now Aligohar Shah, the son of Hazbulla Shah, who had died in 1890. He had been called upon before to exert his influence on the side of order and had candidly professed that he had none. There was difference of opinion as to the sincerity of this profession. That he was indeed sick of the *Hurs* seemed likely enough and also that it was difficult for him to persuade them of this, for any *Khalífa* through whom he issued an offensive order to them was treated as a traitor and stood in peril of his life. But there was no doubt about their implicit submission to his will if he made it unequivocally known; so he was held accountable for their conduct. At last, in March, 1896, he was persuaded, or coerced, into personally addressing a gathering of his followers and telling them plainly that it was really his will that the outlaws should be delivered up. This changed the situation at once. Spies showed the way to a patch of dense scrub in which Piru and two others of the most desperate outlaws had taken up their position, and they were rushed and shot down by a party of the Baluchis under Lieutenant Harold. On the 28th of April three others of the gang avenged this blow by shooting and hacking to pieces the Pir's chief *Khalifa,* Haji Allah Nawázo; but they were splendidly tracked for 22 miles by Head Constable Muhammad Yusif and a few men, and two of them were shot and the third secured. This practically ended the matter. Bachu, having lost his best men and his credit, came in and gave himself up. He was convicted and hanged at Sánghar on 26th November 1896.

The fanaticism of the *Hurs* has not abated, but by strict surveillance, imposition of additional Police and the application of the Criminal Tribes Act they have been kept in hand and have given little trouble. The incidents of 1893—1896 appear, however, to have given

	Dacoity.	House-breaking.
1890	6	......
1891	2	970
1892	4	984
1893	1	997
1894	12	964
1895	9	1,046
1896	14	1,211
1897	13	1,197
1898	14	1,069
1899	27	954
1900	23	1,308
1901	9	1,131
1902	8	1,405
1903	7	1,616
1904	9	1,507
1905	13	1,719

Criminal Justice.

a stimulus to dacoity and house-breaking, as will appear from the figures in the margin, which show the number of cases entered in the returns as "real cases" during the years 1890-1905. Unfortunately the convictions amount to less than 30 *per cent.* of the cases.

Civil Justice.

Civil Justice.
HISTORY.

The Mírs had a wholesome ordinance by which about ¼ of the amount in litigation in every civil suit decided by their courts was taken as a Government fee. This created a general aversion from litigation. Sir Charles Napier reduced the fee to 5 per cent.

For a period of 18 years after the conquest the administration of civil justice was committed to the ordinary magistrates, the Commissioner being the Supreme Court. In September 1861 the Code of Civil Procedure (Act VIII of 1859) was extended to Sind and in the following year the office of Judicial Deputy Magistrate was converted, as already mentioned, into that of Judge. In the same year a Court of Small Causes was established in Karáchi. In 1864 the civil jurisdiction of Deputy Magistrates and Kárdárs was abrogated and special courts, presided over by Munsifs and subordinated to the Judge's court, was established in each of the revenue sub-divisions of the District, for the administration of civil justice. The designation of Munsif was shortly afterwards changed into that of Sub-Judge. In 1866 the civil as well as the criminal judicial functions of the Commissioner in Sind were transferred to the Judge of the Sadar Court appointed under Bombay Act XII of that year. The Civil Courts in each District are enumerated along with the Criminal in the B Volumes. They consist of the following classes:—

CIVIL COURTS.

Court of	Powers.
District Judge	... Principal court of original jurisdiction and court of appeal in respect of orders passed by subordinate courts.
Joint Judge	... Powers co-extensive with those of District Judge, but shall hear only suits made over to him by the District Judge.
Assistant Judge	... Power to hear suits subject matter of which does not exceed Rs. 10,000, which are made over to him by District Judge.

Civil Justice.

Court of	Powers.
Sub-Judge of First Class.	Ordinary powers of 2nd Class Sub-Judge and special jurisdiction in respect of such suits wherein subject matter exceeds Rs. 5,000 as may arise within local jurisdiction of Courts in the district presided over by 2nd Class Sub-Judges.
Sub-Judge of Second Class.	Power to deal with suits the value of which does not exceed Rs. 5,000.
Mamlatdars' Courts. (These are the Mukhtiarkars in charge of Talukas.)	Power to give immediate possession &c. under the Mamlatdars' Courts Act, 1906.
Courts of Small Causes.	The Karáchi Small Cause Court has power to try suits subject matter of which does not exceed Rs. 2,000, the Cantonment Small Cause Court at Karáchi up to Rs. 200, Subordinate Judges of 1st Class up to Rs. 500 and Sub-Judges of 2nd Class up to Rs. 200 or Rs. 50.

There are Registrars in the Court of the Judicial Commissioner and in the Small Cause Court at Karáchi. The former is graded as a Sub-Judge of the 3rd Grade.

With respect to its Civil Courts the Thar and Párkar District is in an anomalous position. For 13 years after the British conquest the whole of what is now that District remained under an Assistant to the Political Agent at Bhuj, who had the title of Deputy Collector, with the exception of the Umarkot and Nára subdivisions, which were incorporated in the Hyderábád District. In 1856 the rest of it was finally brought under the authority of the Commissioner in Sind and became a part of the Province, but it continued to be called a Political Superintendency and the Deputy Commissioner in charge of it enjoyed special judicial powers which he still retains, this District having been excluded from the operation of Act XII of 1866, under which the Sessions and District Courts in the other Districts were constituted. The Deputy Commissioner, Thar and Párkar, is in fact the District Judge of his charge and from his decisions appeal lies only to the Judicial Commissioner's Court. The Deputy Collectors of the Nára

Civil Justice.

Valley and the Desert Talukas have power to try all suits in which the amount of claim does not exceed Rs. 2,000, and the Mukhtyarkars under them have similar powers with a limit of Rs. 200 and even their Head Munshis may decide claims not exceeding Rs. 50. Only the Mirpur Khás Taluka is under the regular Civil Court of the Sub-Judge of Hála. The Upper Sind Frontier was also a Political Superintendency with special arrangements for the administration of Criminal and Civil Justice, but in 1883 it was brought within the jurisdiction of the Shikárpur District Court, which has since 1901 been designated the Sukkur-Lárkána District Court and is now held in Sukkur.

Under the Sind Frontier Regulation III of 1892 the District Magistrate has special powers in the frontier Talukas in civil cases, similar to those described above in connection with the Criminal Courts. Whenever he is satisfied that a dispute exists which is likely to lead to a blood-feud, murder, culpable homicide, mischief, or a breach of the peace, he may refer the dispute to a Council of Elders and pass a decree on their finding; but he is not bound by their finding.

The change above described in the constitution of the Judicial Commissioner's Court has had the same effects on the civil as the criminal side. The District Court of Karáchi is now absorbed in the Judicial Commissioner's Court.

WORK OF CIVIL COURTS.

The work of the various Civil Courts in each District is shown in Table XVIII. The work done by the Sadar Court is shown below:—

Description of Work.	Number of suits disposed of in		
	1903.	1904.	1905.
Appeals	93	89	124
Applications	61	73	66
Total ...	154	162	190

REGISTRATION.

Registration.

Under Act III of 1877 the registration of all deeds affecting immoveable property is, subject to certain exceptions, compulsory, whilst the registration of wills and documents relating to move-

able property is optional. Registration is effected in the office of the Sub-Registrar within whose sub-district the whole or some portion of the property affected by the document presented is situated. The work of the Sub-Registrars is supervised by, and their decisions are appealable to, the District Registrar, who is the Collector. The Sub-Registrars are in some cases special officers who are remunerated with one-half of the fees taken by them; in other cases the Head Munshis in the Taluka Offices are made *ex-officio* Sub-Registrars and remunerated from the fees in addition to their salaries. The amount of this remuneration varies very much. Some of the *ex-officio* Sub-Registrars in Thar and Párkar scarcely get a rupee in the month, while the emoluments at places like Sukkur and Lárkána come to an average of Rs. 70 or Rs. 80. At Karáchi and Hyderábád there are salaried Sub-Registrars, who get nothing from fees. With a few exceptions, there is a Sub-Registry, for each Taluka. Lists of them will be found in the B Volumes.

Registration.

The Registration Department in Sind is under the control of the Inspector General of Registration for the Bombay Presidency, who makes a personal inspection of its work during his tours. A continuous scrutiny is exercised by a special Inspector of Registration for Sind, who submits his reports direct to the Inspector General, sending copies to the District Registrar.

Statistics of the work of the registration offices in each District will be found in the Table. The effect of the introduction into Sind in March 1901 of certain provisions of the Deccan Agriculturists' Relief Act is visible in the marginal table, which records the number of sales and mortgages effected in Sind between Musalman landholders and Hindu money-lenders for four years prior and subsequent to the application of the law.

Year.	Sales.	Mortgages.
1897-98	2,515	4,732
1898-99	3,046	4,546
1899-1900	3,361	4,796
1900-01	3,305	5,210
1901-02	2,590	1,648
1902	3,318	1,285
1903	4,161	1,763
1904	4,293	1,368

POLICE.

Police.

HISTORY.

The introduction into the Province of an organised Police Service was entirely the work of the British Government. The

Police.

duties of police were entrusted by the Mírs to the *Kárdárs* and *Jágírdárs*, under whom watchmen were employed to guard the town-gates by day and to patrol by night, while villages had their own watchmen and trackers, who were paid at harvest time like other village servants. In Hyderábád a Kotwal, or City Magistrate, with police powers and a force of 20 peons, was employed, whose remuneration, like that of all the Amirs' establishments, consisted partly of perquisites. In the country an unwritten law held every *zamindar* answerable for any criminal tracked into his limits until he was tracked out again. This, seconded by the prompt and stern punishments in vogue, was very effective, and there is evidence that the introduction of British methods was followed by a noticeable increase of ordinary crime. The system of Military Police indroduced by Sir Charles Napier has been mentioned in Chapter III. According to Sir Bartle Frere it was far in advance of any other in India and became the model for most of what was good in subsequent reforms of the Indian Police. And it has undergone less change than any other branch of his administration. Two cardinal principles of the system were that a Police Officer should be independent of the magistracy and that he should exercise no magisterial functions. The command of the Sind Police was entrusted to a Military Officer styled the Captain of Police, under whom three Lieutenants of Police, also military officers, controlled the District forces of Karáchi, Hyderábád and Shikárpur. The second Captain of Police was Lieutenant E. C. Marston, who saved Sir Charles Napier's life at the battle of Miani, and he remained the head of the Department until the appointment was abolished. Afterwards General Marston was a well known figure on the Karáchi race-course until his death in 1902, about 59 years after the conquest. In 1861 the designation of Captain was altered to that of Commandant, the Lieutenants becoming Captains of Police. In 1865, on the posts of Commandant and Captain being abolished, the immediate control of the police devolved upon the Commissioner in Sind, and the district forces were placed under the command of Superintendents. In 1905 the Commissioner's supervision of matters concerning the equipment, discipline and efficiency of the force was transferred to a Deputy Inspector General of Police for Sind.

STRENGTH.

There have been additions and partial re-organisations several times since that and at the present time an extensive re-organisa-

Police.

tion is impending in pursuance of the recommendations of the Police Commission of 1902. The following figures show briefly the small advance that has been made in the last 30 years. In 1875 the Police force for the three Districts of Karáchi, Hyderábád and Shikárpur consisted of three District Superintendents, one Assistant District Superintendent (for Karáchi town), 13 Inspectors and 3,343 petty officers and constables. Besides these there were in the Upper Sind Frontier 115 men and in Thar and Párkar 502 under the Political Officers, i. e., Deputy Commissioners, who were the Superintendents of Police for their Districts. The proportion of policemen to area and population at that time in each District is shown below:—

Karáchi ...	1 Policeman to	12 sq. miles,	and to	575	of the inhabitants.
Hyderábád	1	„	11	„	824	„
Shikárpur	1	„	9	„	686	„
Upper Sind Frontier	1	„	19	„	831	„
Thar and Párkar	1	„	25	„	358	„

At the end of 1905 there were in the Province 4 District Superintendents, besides the Deputy Commissioners of the Upper Sind Frontier and Thar and Párkar, 6 Assistant Superintendents, 21 Inspectors, 80 Sub-Inspectors, 6 Sergeants, 836 Head Constables and 3,715 Constables. The proportion of policemen to area and population was as follows:—

Karáchi ...	1 Policeman to	10·32 sq. miles	and to	384·92	of the inhabitants.
Hyderábád	1	„	7·05	„	849·49	„
Sukkur ...	1	„	9·36	„	727·88	„
Lárkána ...	1	„	7·50	„	966·25	„
Upper Sind Frontier.	1	„	7·27	„	639·24	„
Thar and Párkar.	1	„	23·28	„	639·92	„

It will be seen that the Police force, though better officered, is numerically weaker in proportion to the population than it was 30 years ago. The proposed re-organisation includes an addition of more than 1,600 to the total strength of the force, and of about 100 to the existing Police Stations, with the abolition of about 250 out-posts, an improvement in the gradation and salaries of District Superintendents and the creation of a new class of native

Police.

officers under the title of Deputy Superintendents, on salaries ranging from Rs. 250 to Rs. 500. The two last items of the scheme have been sanctioned and partly carried out, a Deputy Superintendent having been appointed for every District except the Upper Sind Frontier, and the Assistant Superintendents in the Upper Sind Frontier and Thar and Párkar having been made Superintendents; but the increase and re-distribution of the rank and file, with other parts of the scheme, are still under consideration. Another change, which has been sanctioned and will be carried out immediately, is the placing of the Railway Police under a Superintendent of the Sind establishment. The Sind Railways have been policed since 1893 by the Punjab Railway Police. It has also been decided to make the Riverain Police permanent. This was a small temporary force of 13 officers and 46 men (shown in Table XX, Hyderábád District, as "Extra Guards") employed on the banks of the river.

DISTRIBUTION AND CONSTITUTION.

The distribution of the existing force, as it stood at the end of 1905, is shown for each District in Table XX. There were District Superintendents of Police in the four regular Districts, with two Assistant Superintendents of Police at Karáchi, one at Hyderábád and one at Sukkur, while the Deputy Commissioners in the Upper Sind Frontier and Thar and Párkar had Assistant Superintendents of Police under them. Of the 836 Head Constables 272 were mounted and of the 3,715 Constables, 884. There were 469 armed with rifles, 2,006 with smooth-bore carbines and 99 with revolvers. Others were armed with swords and batons. With respect to nationality the Superintendents and Assistant Superintendents and 7 of the Inspectors and the 6 Sergeants were Europeans. Of the remainder 1,001 were Hindus and 3,527 Musalmans. It is remarkable that among the Hindus there are more Brahmans than men of any other caste. Marathas come next: the whole force is largely foreign to the Province. Of the officers 527 and of the men 1,049 are reported as able to read and write.

WORK.

The proportion of convictions obtained by the Police in 1904 is contrasted below with the two previous decennial averages. The

comparison is unfavourable, but during the last three or four years the number of cases reported has advanced. **Police.**

Period.	Average annual number of cases reported.	Average annual number of cases sent up for trial.	Average annual number of cases ending in discharge or acquittal.	Average annual number of cases ending in conviction.	Average annual percentage of cases ending in conviction upon cases sent for trial.
1881-1890 ...	11,035	5,661	1,354	4,266	75·36
1891-1900 ...	9,310	4,452	752	3,647	81·92
1904	8,870	3,951	1,123	2,657	67·25

VILLAGE POLICE.

The only village police in Sind consists of village head-men and trackers. Formerly, under a system introduced by Sir Bartle Frere, the aid of village head-men on behalf of the magistracy and police was rewarded by the grant of the revenue-free tenure of a small area of land. But grants of this nature, which constitute a charge upon provincial revenues, are no longer made and will be extinguished by the death of the present holders. The remuneration of village head-men, whose services to the administration it is considered expedient to reward, or whose co-operation it is desired to enlist, is now provided for by the Sind Village Officers Act, 1881, and, instead of their being paid in cash, the money is devoted to the discharge of the assessment on a small portion of the incumbent's holding. The number of head-men remunerated in this manner in 1905 was 88 and the average annual compensation in each case Rs. 48. Both descriptions of grant are known as *seris* and the holders as *seridars*. Trackers, or *pagis* ("puggees"), receive a small retaining fee, which is also paid out of the Village Cess Fund. For a Taluka tracker, who may be required to accompany a police officer throughout an investigation, the fee is Rs. 10 per mensem, whilst for a village tracker, whose duty ordinarily ends at the village boundary, it is Rs. 5. The duty of a tracker is to track offenders and stolen animals when called upon to do so by a village head-man, or by the police, to report the appearance of suspicious characters and animals suspected to be stolen or strayed, and to give information likely to prevent the commission of an offence. The skill with

Police.

which the trackers of Sind follow the footprints of men and animals for long distances seems miraculous to an outsider. With their help a "pug" becomes a record for identification as good as a thumb impression, and during the *Hur* troubles the movements of the principal outlaws and their participation in particular crimes were often ascertained by this means.

Jails.

Jails.

Under the Mírs imprisonment in default of payment of a fine was very common. When a thief was caught he was fined four times the value of the property stolen, three-fourths of the fine being taken for Government and one-fourth restored to the complainant. If the man was too poor to pay he was kept in durance till his friends paid for him. But he was not maintained at the expense of the State. On the contrary he was taken out daily to beg for food and whatever he got in excess of actual necessities was appropriated for Government; so he became a source of revenue. Imprisonment for an indefinite period was also a common punishment for murder. But it does not appear that there were many prisons. Criminals were shut up in a guard-house, or put in stocks, or chained up. The Jail of modern civilisation was therefore a novelty to the Sindhi and the first effect of it is thus described in an official report made by Lieutenant Hugh James in 1847. "When it became known that the prisoner in jail was as well, and in many cases better off than the labourer, the cultivator, or the artisan; receiving his anna per diem and doing little, if any, work—feeling too that his family were comfortable at home and that, in cases of theft, the property was concealed and ready for him on his release, it naturally followed that imprisonment lost all its terrors; and I am of opinion that many cases of cattle theft occur in which the sole object of the prisoner was to get jail subsistence." Principal Jails were established by Sir Charles Napier at Hyderábád, Shikárpur and Karáchi and minor prisons at many places. The management of the first was entrusted to the Lieutenant of Police and that of the others to the Deputy Magistrates. The Captain of Police controlled the whole. With the introduction of the Criminal Procedure Code and the remodelling of the machinery of justice the administration of prisons passed out of the sphere of Police duties. Since 1863 the jurisdiction of the Inspector

General of Prisons of the Presidency has included Sind. There are now in the Province one Central Prison of the 2nd Class at Hyderábád, two District Prisons at Karáchi and Sukkur, and one Extra-mural Prison called the Sind Gang. The Central Prison at Hyderábád is under a Superintendent, who is a Commissioned Officer of the Indian Medical Service. The Sukkur Prison is under the Civil Surgeon of the station as an additional duty, and the Karáchi Prison is under a combined Jailor and Superintendent, the medical charge of it being assigned to a medical officer as an additional duty. The Sind Gang is under the Superintendence of an Assistant Surgeon and is located in temporary premises wherever there is work for it to do for the time being. To it are sent from the other Jails prisoners under sentence of rigorous imprisonment who are fit, or only fit, for extra-mural labour. There is also a Sub-jail at Umarkot. There were other Sub-jails at Kashmor, Hala, Guni, &c., as shown in Table XXI, but they are classed now with Lock-ups and it is proposed to reduce the Umarkot Sub-jail likewise. In these prisoners on trial are detained and those on short sentences, not exceeding one month. At Umarkot Sub-jail prisoners are retained whose terms do not exceed three months. Further particulars of the prisons in each District will be found in the B Volumes.

Jails.

The employment of prisoners on useful and profitable industries is a practice of old standing in the Sind Jails, but received a serious check some years ago by an outcry that was raised against interference with private enterprise. Since that the prisoners have been employed mainly on the production of articles of clothing and food for their own use and that of the prisoners in minor prisons; but certain articles which are not considered likely to enter into competition with any local industry are also made for supply to other Government Departments, or sale to the public. Foremost among these are cotton and woollen carpets, for the excellence of which the three principal Jails have acquired a reputation and about which something has already been said in the article on Manufactures in Chapter VIII. Other articles of this character are coir matting, towels, table-cloths and other cotton fabrics, articles of cane and reed, such as chairs, baskets, chicks &c., and some newly invented fabrics, among which the mats of *munj* grass made at Shikárpur have for some time been in great demand.

The Sind Gang is employed on out-door work, chiefly for the Public Works Department, such as excavation and clearance of canals, making of *bands* and railway work.

CHAPTER XI.

LOCAL AND MUNICIPAL.

TABLES XXVII A AND B, XXVIII.

LOCAL FUNDS.

No separate fund for expenditure on local works of public utility existed in Sind generally prior to 1863. The miscellaneous taxes upon trade levied by the Talpurs were abolished on the British annexation, though in the territories resumed nine years later from the ruler of Khairpur the principle was retained as embodying the germ of future taxation for local purposes. In these territories the opposition which was at first manifested to the retention of the taxes relaxed as soon as the tax payers realised that the money was actually expended on local requirements and that they in consequence escaped the calls frequently made on the time, labour and purse of the public in districts where no such fund existed. When in course of time the inherent evils of the system forced themselves into notice the character of the taxation was altered: the town and transit duties were abolished and a cess of 9 pies per each rupee of the land revenue was substituted. The poll and professional taxes were replaced by a light tax of 4 annas a month upon permanent shops and of 2 annas a month upon temporary stalls for the sale of fish and vegetables. From that time all opposition to the taxes vanished and they continued in force till 1860, when they were abolished on the passing of the Income Tax Act.

In 1863 Government ordered the establishment of Local Funds throughout the Bombay Presidency. The fund in each District consisted of a cess fixed at one anna for every rupee of assessment to the land revenue, toll and ferry receipts, the surplus income from cattle-pounds and other items. One-third of the proceeds of the cess was apportioned to the service of education in rural tracts and the balance to the construction and repair of roads, wells and buildings, the planting of road-side trees and other works of public utility. The system was conducted at first

without resort to legislation, but eventually it was found necessary to legalize the levy of the cess. The validating enactment applying to Sind is Bombay Act VIII of 1865, the substantive provisions of which are still in force. The Act authorizes the levy of a cess on land not exceeding one anna on every rupee of the ordinary land revenue, of a cess, in the case of jagir and other alienated lands, of 5 *per cent.* upon the assessable value, of a cess not exceeding one anna on every rupee leviable under the head of land or other revenue from the farmers of revenue and of a tax upon shops at rates not exceeding Rs. 10 *per annum.* The last mentioned provision has never been enforced since the passing of the Act and the cess leviable from the farmers of excise revenue was discontinued in 1874; but the cess on land, whether alienated or not, is still in force and provides the bulk of the revenue assigned to Local Funds.

The intention that the tax-payers should have an influential voice in the disposal of the funds was one of the cardinal features of the scheme of 1863. But invitations elicited no response from the tax-payers and in 1880 it was observed that the committees which had been constituted rarely met and that all initiative control and responsibility rested with the Collectors and their Deputies. In 1882 Lord Ripon's scheme for the extension of local self-government was formulated and it was embodied two years later in an enactment, Bombay Act I of 1884, regulating the administration of Local Funds throughout the Bombay Presidency. Under this statute the management of local affairs in each District is entrusted to a District Local Board having authority over the entire District and to Taluka Local Boards. The District Local Board consists, except in the Upper Sind Frontier and Thar and Párkar Districts, of between 20 and 30 members, of whom half are elected, exclusive of the president, and half nominated by the Commissioner in Sind. The elected members represent the Taluka Local Boards, Municipalities and Inamdars who are holders of entire villages. The nominated members include the Collectors, Assistant and Deputy Collectors and the Executive Engineers of the Districts. The Educational Inspector, the Deputy Sanitary Commissioner and the Civil Surgeon, if he is a Health Officer, have the right of attending the meetings and joining in the deliberations of the Board, without voting. The constitution of the Board for each District is given in the

B Volume pertaining to it.

The Taluka Boards consist of about fifteen members, of whom half are nominated and half elected. The Assistant or Deputy Collector in charge of the Taluka is invariably appointed member and president of the Taluka Board. Under these circumstances the Boards have the right of electing a member to the office of Vice-president, which however in practice is without exception bestowed on the Mukhtyarkar. The electorate comprises two classes of persons, the first deriving its privilege from real property situated in the Taluka and bearing an assessment, or asessable value, of Rs. 48 per annum, or a value of Rs. 5,000, and the second including residents in the Taluka whose annual income is not less than Rs. 500, or whose monthly pension is not less than Rs. 50. Honorary Magistrates also possess the franchise.

The District Board meets twice a year generally, in October, when the budget for the next financial year is framed, and again in June, when the savings of the past year are reported and appropriated. The current business of the board is usually entrusted to an Executive Committee of half a dozen members. Though no regulations have been prescribed for the meetings of the Taluka Boards, they are expected and generally contrive to meet at least four times in the year: in some cases they meet monthly. The Taluka Boards draw up their own budgets. These are submitted for the sanction of the District Board, which, after such revision as may be necessary, sanctions them and prepares one budget for the whole District.

The Boards derive their income from revenues vesting in them by law, from receipts assigned to them by Government, from grants made by Government and Municipalities and from sums received in execution of their functions. The first head comprises the net proceeds of the cess on land, of public ferries, of license-fees for the sale of poisons in non-municipal areas and of fees levied on the removal of sand and stone. The second description of receipts is composed of the net income derived from cattle-pounds, of sums realized by the sale of fishing rights and of fees levied on the removal of fuller's earth. The annual grants made by Government consist of a lump sum in lieu of the one anna cess formerly levied from the farmers of excise revenue, grants in aid of primary and technical education, grants for the construction

of school buildings and grants for local public works. Contributions are received from almost all mofussil municipalities towards the pay of Local Fund vaccinators. The other income of the Boards embraces such items as interest on investments, school and examination fees, receipts from technical schools, dispensaries, veterinary dispensaries, experimental farms, fairs, road-side trees, staging bungalows, gardens and the sale of materials. The details will be found in Table XXVII. The revenue from certain of these sources is allotted by the Act to Taluka Boards, especially all local receipts which come under the last-named head. In addition to this the District Local Board distributes among the Taluka Local Boards so much of the receipts from the land cess and excise grant as remains after deducting the portion devoted to education and providing for its own requirements.

The portion of the fund devoted to education comprises, in addition to receipts from educational institutions and specific grants, one-third of the proceeds of the cess on land and of the compensation paid by Government in lieu of the abolished cess on excise revenue, and one-third or two-fifths of the cess on *jagir* land. This fund is administered, subject to the general control of the District Board, by the Educational Inspector in Sind.

Charges on account of the administration of the fund are required to be defrayed by the District Board, which is also responsible for the construction and repair of the main roads of the District and the maintenance of public vaccinators and dispensaries. In addition to these services the District Board digs wells and maintains or assists veterinary dispensaries, experimental farms and botanical gardens and other works of general utility to the District.

The funds at the disposal of the Taluka Boards are devoted principally to the repair of roads, and other works within the Taluka, including the local water-supply and sanitation. Large works required for a Taluka, but beyond its means, may be undertaken, or assisted, by the District Local Board. The principal works maintained by the Local Boards in each District are mentioned in the B Volumes.

Projects costing less than Rs. 500 are drawn up and executed by the boards without professional assistance. Works estimated

to cost between Rs. 500 and Rs. 2,500 are carried out by the Boards after the plans and estimates have been prepared or approved by the Executive Engineer. The execution of works costing more than Rs. 2,500 is required by Government to be entrusted to the Public Works Department. The Executive Engineer's approval is also necessary to road projects, either of construction or repair, of which the cost is estimated to exceed Rs. 50 per mile.

The District Boards employ overseers or *mistris* according to their needs for the preparation of plans and estimates and for the superintendence of works undertaken either by themselves or by the Taluka Local Boards. Works Committees are appointed to supervise work in progress, but effective interest in a duty often difficult and opprobrious is rarely displayed by non-official members and in practice the task mainly devolves on the official chairman, the Mukhtyarkar, and to a less extent on the Assistant Collector. The initiative in works of improvement rests with the Collector and his Assistants.

The elective franchise has not been extended to the Upper Sind Frontier and Thar and Párkar Districts, excepting that the Municipalities of Umarkot and Mirpur Khas elect a member each to represent them on the Taluka Board. The District Local Boards of those Districts are nominated by the Commissioner in Sind and include the principal officials. The Taluka Boards also, with the exception mentioned, are filled by nomination. In other respects the system is worked in the same way as in other Districts.

The revenue of the Local Boards in the Province has risen from Rs. 7,07,030 in 1889-90 to Rs. 8,38,612 in 1894-95 and Rs. 9,55,866 in 1904-05. The income and expenditure for ten years under a few principal heads are shown in the following Table :—

Year.	Income.					Expenditure.			
	Provincial rates.	Cattle Trespass Act.	Contributions.	Tolls on Ferries.	Total Income.	Education.	Hospitals and Dispensaries.	Civil Works.	Total Expenditure.
1895-1896	5,28,042	31,083	2,51,603	61,181	9,30,312	2,57,021	45,989	4,29,364	9,07,044
1896-97	4,68,359	33,175	2,55,411	55,614	8,74,728	2,44,261	53,981	4,34,435	8,83,055
1897-98	4,94,362	22,491	2,39,507	37,082	8,41,553	2,41,559	39,186	3,89,266	8,59,879
1898-99	5,42,090	18,806	2,25,758	40,527	8,65,800	2,40,492	41,125	4,21,488	9,25,213
1899-00	4,84,399	20,595	2,39,131	37,043	8,24,349	2,29,705	47,562	3,44,270	8,17,410
1900-01	4,91,702	12,116	2,22,023	40,463	8,08,063	2,27,847	48,752	3,66,209	7,87,493
1901-02	5,88,744	7,280	2,19,310	26,772	9,07,161	2,33,178	46,756	4,05,223	8,65,330
1902-03	5,39,778	8,561	2,37,400	26,012	8,71,200	2,50,257	50,562	4,27,633	8,89,034
1903-04	5,36,759	12,714	2,42,029	26,579	8,77,011	2,67,520	51,024	4,35,037	9,23,295
1904-1905	5,99,124	10,306	2,58,749	31,302	9,55,866	2,83,120	43,608	4,09,766	8,95,804

The amount expended on roads during the same years is shown in the margin. Of 61 Hospitals and Dispensaries in the Province 24 are maintained from Local Funds. Under the grant-in-aid scheme introduced in 1893-94, works connected with village sanitation and provision of drinking water in rural areas are entrusted to Village Sanitary Committees in places where these Committees have been formed. Local Funds contribute ⅓ of the cost of such works initiated and executed by Sanitary Committees, the village concerned paying one-half and Government one-sixth.

Year.	Roads. Original Works.	Repairs to Roads.
	Rs.	Rs.
1895-96 ...	14,104	10,486
1896-97 ...	27,180	18,002
1897-98 ...	16,715	16,586
1898-99 ...	24,786	10,351
1899-1900 ...	48,610	2,01,583
1900-01 ...	83,534	1,98,236
1901-02 ...	73,782	2,22,188
1902-03 ...	77,709	2,27,778
1903-04 ...	91,989	2,17,558
1904-05 ...	69,320	2,20,020

VILLAGE SANITATION ACT.

The question of devising some remedy for the normally insanitary condition of the villages had been under consideration for some time before Act I of 1889 provided legal machinery for the purpose. No time was lost therefore in making a beginning by the application of Part II of that Act to selected villages. In 1894 Government intimated their wish that the Act should be applied only where a desire for it was expressed and this principle has been observed since. It has not prevented the extension of the operation of the Act and there are at the present time 84 villages in which there are Sanitary Committees, as shown in the margin. The Act and the rules issued under it allow much liberty of adaptation to circumstances and accordingly there is a good deal of variety in the constitution of the Committees and their operations. The number of members of the Committees varies from 3 to 7. Commonly the Mukhtyarkar of the Taluka and the local medical officer, if there is one, are members, the former being the chairman; but there are Committees on which there is no official member. They commonly meet once a month, but from some quarters complaints

District.	Number of Villages.
Karáchi	21
Hyderábád	19
Sukkur	5
Lárkána	29
Thar and Párkar ...	10
Upper Sind Frontier ...	...
Total ...	84

come of apathy and indifference. As regards income the usual rule is that the village raises one-half by subscription, while the Local Fund gives one-third and Government one sixth; but in some villages a good deal more than half has been found by the inhabitants, while in others it has been found difficult to collect their share. The annual incomes of the Village Committees range from Rs. 37 to Rs. 1,545. The money is expended in paying sweepers to keep the village clean, lighting it, clearing away jungle, repairing tanks, digging *kacha* wells and other petty works having a sanitary tendency. The general verdict of the District officers is that, if the Sanitary Committees have not done all that might be desired, they have done something and the villages are the better for them.

MUNICIPALITIES.

The history of Municipal government in the Province of Sind falls into three divisions; the first from 1851 to 1878, during which Act XXVI of 1850 was in force, the second embracing the years between 1878 and 1901, the period covered by Bombay Act VI of 1873 as amended by No. II of 1884, and the third beginning from the introduction of the District Municipal Act III of 1901.

After the conquest of Sind (1843) Boards of Conservancy were constituted under Act XXI of 1841 in Karáchi and Hyderábád by Sir Charles Napier to advise the Governor on conservancy matters. In the rest of Sind the responsibility for the cleanliness of the towns rested with the inhabitants and the local officials. This collective responsibility could be enforced by resort to the provisions of Section 19 of Bombay Regulation XII of 1827 and fines inflicted upon persons found creating nuisances. But the larger Municipal measures—such as provisions of roads, lighting and water-supply within town—were left to *Panchayats* and the townspeople. Government indeed provided in 1850 a small amount for expenditure by the Collector and District Magistrate on works of public utility—roads, dharamsalas, wells &c.; but such Government assistance went but a very little way. The chief obstacle to progress was lack of funds. In some towns, such as Hyderábád, it was customary for the *Panchayat* to levy a small town duty on all grain imported; in other places a light poll tax, or a fine on marriages, was levied and the proceeds utilised in defraying the cost of conservancy. With a view to provide funds and to make the inhabitants realise their responsibility for the

cleanliness of towns, Sir (then Mr.) Bartle Frere moved Government to apply to Sind Act XXVI of 1850, which had been tried with good results in Bengal. The Act was accordingly applied to Karáchi on the 8th September 1852 and then extended to Hyderábád, Sukkur, Shikárpur and many other towns. Its provisions were extremely simple in character. The Act could not be applied to any town except at the express desire of the majority of the townspeople. The Magistrate of the town and the principal inhabitants were to be appointed Commissioners by Government. Power was taken to levy house-tax, or house assessment, and town duties, and the expenditure of such funds was left entirely to the Municipality. Power was taken to define nuisances and, if necessary, to punish offenders. These were the principal provisions of the first Act, which did not cover altogether more than fourteen sections. To prevent control passing entirely into the hands of Government officers, Government directed that propositions should not be carried except by majorities of not less than ⅔ths and that the Magistrate's interdiction of any works which at least ¼th of the Commissioners desired carried out should be reported to Government. The provision of schools was not a part of the duties of Municipalities, as Government did not consider that schools could be regarded as Municipal institutions of such a nature that their expenses should be defrayed from Municipal funds raised for general Municipal purposes. Funds for such institutions of this nature as were not self supporting should be provided for by special contributions intended for the purpose and obtained from the contributors with their knowledge that they were to be so expended. But no objection was taken to the maintenance of dispensaries, as these, being available to all classes, were of general utility. House-tax, always unpopular, was opposed from the outset by several Municipalities. The principal sources of income were octroi and wheel tax. Several articles, such as opium, salt and country-liquor, which are now specially protected, were subject to taxation. Up till 1872 octroi duties on imports as well as on exports were farmed out to contractors. In addition, the revenue from all or some of the following sources were usually assigned to Municipalities.

(1) Proceeds of unclaimed property up to a fixed amount.

(2) Municipal fines under Regulation XII of 1827 and Act XXI of 1841.

(3) The balance of Registration fees.

Act XXVI of 1850 was amended by Bombay Act I of 1871, which imposed on Municipalities the duty of paying a portion, not exceeding 20 per cent. of their gross revenues, of the cost of town Police, and finally repealed by Bombay Act VI of 1873, which, however, was not applied to the Province of Sind till the 1st October 1878. Under the latter enactment the Municipalities were divided into City and Town Municipalities. The City Municipalities, in which alone the elective principle obtained, were comparatively few and the town municipalities were composed entirely of nominated members. Under the new Act certain public property was vested in Municipalities, who were further empowered to raise by taxation funds which were to be applied to the promotion of public health, safety and convenience. The Police charges borne by Municipalities were limited to one half the cost of the Police. The amendment of Bombay Act VI of 1873 by Bombay Act II of 1884 was the means of introducing further important changes in Municipal Government. The principal of these were the extension of the elective principle, the exemption of municipalities from all liability to pay for Police and the obligation imposed upon them to establish and maintain middle class and primary schools. The general duties of Boards were divided into two classes, first those duties which were obligatory and for which the Boards were bound to make 'adequate' provision out of their funds and property, and next those which were merely discretional.

The Bengal, United Provinces and Punjab Municipal Acts were consulted for some of the important changes introduced in the present Municipal Act III of 1901, which brought in the third period of Municipal Government in Sind. Among other matters this Act provides for Municipal Councillors vacating their seats on failure, without leave from the Municipality, to attend at least one meeting for a period of four months, the appointment of *ex-officio* councillors and presidents, election of councillors by sections of the inhabitants, public bodies, and associations, management of trusts and the enforcing of information as to dangerous diseases and liability to Municipal taxation. Municipalities are bound now to make "reasonable" instead of "adequate" provision for fulfilling their obligatory duties and, if called upon by Government, to provide for the maintenance and treatment of lepers and lunatics at any asylum or hospital within the Municipal

District. A novel feature borrowed from the Punjab Act is the power to constitute "Notified areas" in places which are not large or important enough to have Municipalities.

There are now 25 Municipalities in the Province, which may be classified as under:—

Population.	No. of Municipalities.
100,000 and over	1
10,000 to 100,000	6
10,000 and under	18

In 1884-85 there was no Municipality with a population of over 100,000, 6 with a population of over 10,000 and under 100,000 and 29 with a population under 10,000, making 35 in all. Some of the last were towns with little or no trade and so small a population that the Boards found great difficulty in making ends meet. Nine of these little Municipalities were therefore abolished during the decade 1884-1894 and one more during 1894-1904. On the other hand, owing to the expansion of cultivation on the Jamrao Canal and the proximity of the Hyderábád-Jodhpur Railway, Mírpur Khás rose into sufficient importance in 1901 to be constituted a Municipality. Thus there were 26 in 1903-04. Of these Mithi was abolished from the 1st January 1905, leaving 25. The elective franchise was extended to Karáchi, Hyderábád, Shikárpur and Sukkur in 1884-1885 and to Kotri and Jacobábád in 1885-86. All the other Municipalities are composed entirely of nominated members.

The incidence of taxation per head for all the Municipalities for the year 1904-05 was Rs. 2-4-10. The appended table shows the total income and expenditure for the ten years ending 1904-05 and the principal items of income and expenditure.

Year.	Income.						Expenditure.					
	Total Income.	Octroi.	House-tax.	Halalcore Cess.	Water-rate.	Sale proceeds of land and produce of land.	Total Expenditure.	Conservancy.	Hospitals and Dispensaries.	Education.	Drainage.	Water supply.
1895-96 ...	16,44,817	6,11,669	53,839	46,230	94,254	1,15,320	20,65,965	2,45,163	74,375	1,55,185	79,081	2,39,081
1896-97 ...	19,66,150	11,60,048	40,544	50,540	87,024	1,17,639	19,49,263	3,29,490	63,715	1,36,683	52,296	1,53,515
1897-98 ...	23,64,974	11,45,635	80,152	72,394	1,29,382	44,575	24,04,881	5,45,341	61,671	1,07,146	62,284	91,239
1898-99 ...	27,10,091	13,88,010	69,615	88,736	1,42,947	47,597	26,11,301	2,87,001	64,576	1,21,619	44,883	1,80,550
1899-1900.	30,44,725	14,05,824	1,31,734	85,801	1,86,509	46,159	29,31,888	2,83,194	76,259	1,19,647	36,894	1,36,536
1900-01 ...	22,98,515	12,85,493	1,12,887	87,861	1,85,820	68,432	24,31,300	3,03,887	73,504	1,26,311	33,621	87,448
1901-02 ...	30,19,102	21,30,430	1,12,533	87,458	1,87,121	46,877	28,74,916	3,16,437	73,067	1,33,677	37,072	98,616
1902-03 ...	28,00,175	16,20,197	1,34,157	97,008	2,14,876	56,849	26,91,742	3,35,660	78,682	1,43,101	33,798	76,314
1903-04 ...	24,91,273	15,19,204	66,725	96,164	1,57,916	66,649	23,61,601	3,06,497	79,567	1,63,172	32,565	81,840
1904-05 ...	34,53,153	20,60,876	71,174	95,885	1,53,718	1,29,225	28,68,584	2,99,555	82,061	1,74,728	36,568	1,49,944

The total income of Municipalities has advanced from Rs. 8,97,109 in 1884-85 to Rs. 25,15,608 in 1894-95 and Rs. 34,53,153 in 1904-05, or nearly quadrupled itself during the past twenty years. It is composed principally of Octroi, House Tax, Halalcore cess, Water Rate and Sale Proceeds of Lands. Octroi revenue, which is now never farmed but collected departmentally, has increased from Rs. 4,95,969 in 1884-85 to Rs. 20,60,876 in 1904-05, in spite of the efforts made to restrict the duty to as few articles of general consumption as possible and to encourage direct taxation. These figures may give an erroneous idea unless it is borne in mind that refunds are liberally given by all Municipalities on articles exported from the Municipal area. The amount of these refunds has increased from Rs. 3,26,997 in 1884-85 to Rs. 6,38,972 in 1894-95 and Rs. 11,57,879 in 1904-05. The minimum refund claimable is fixed at 4 annas by some Municipalities and by others at 8 annas, so that they may be claimed even by individuals removing small parcels of merchandise to villages. The Karáchi Municipality has been permitted to retain a "drawback" of $\frac{1}{10}$th of refunds in consideration of the facilities afforded to the trade that passes through the town. House Tax is perhaps the most unpopular form of taxation and in one case the Municipality have consistently opposed its introduction since 1852. The receipts from this tax, which is levied in five only out of the twenty-six Municipalities, have risen, within the last twenty years, from Rs. 25,334 to Rs. 71,173 or more than two and half times, while those from Halalcore Cess, which is hardly less unpopular and is levied in fourteen Municipalities, has advanced to twelve times the figure for 1884-85, *viz.*, Rs. 8,662. On the other hand the sale proceeds of waste lands have decreased owing to the diminution of waste areas and the depreciation in recent years in the value of building sites owing to the prevalence of plague in Karáchi. The large revenue from water-rates which the Karáchi, Hyderábád and Sukkur Municipalities obtain is almost entirely earmarked for expenditure in repayment of loans and maintenance of water works. *Per contra* the expenditure of Municipalities, which was Rs. 10,16,594 in 1884-85, and Rs. 25,38,394 in 1894-95, was Rs. 28,68,584 in 1904-05.

The Municipalities of Karáchi, Hyderábád and Sukkur have Water-works, but Karáchi alone has a scientific system of drainage, which is now about to be extended to several undrained

quarters of the town. In the other Municipalities the water supply is derived from tanks, wells, canals and the River Indus; their conservancy is carried out by sweepers with the assistance of carts, and where any attempt at drainage is made, surface drains are used.

Municipal government has advanced with the increase of trade, the opening of large irrigation works and the extension of cultivation. The larger Municipalities are generally more enlightened and progressive than in the mofussil of the Presidency Proper. In the small Municipalities efficiency depends very largely upon the energy and initiation of the Mukhtyarkar and the Assistant Collector.

Of the military cantonments established at the British conquest only those of Karáchi and Hyderábád survive. Another was established at Jacobábád in 1847, when Major Jacob was appointed to the charge of the frontier and made his head-quarters there, and Manora was constituted a cantonment in 1903. These are all now under the Cantonments Act, XIII of 1889, and are controlled by Committees constituted under the Cantonment Code of 1899. They derive their income from taxes imposed under the Act and apply it to conservancy, maintenance of roads, and other necessary purposes. At Karáchi and at Hyderábád the Cantonment Committee has an arrangement with the Municipality under which certain Municipal dues paid by residents in the Cantonment are adjusted by an annual payment to the Cantonment Committee by the Municipality. CANTONMENTS

CHAPTER XII.

EDUCATION.

Tables XXIX-A to D.

HISTORY.

Prior to the coming of the British the condition of education in Sind was very similar to what it was at one time in England. The gentry generally were of the same mind as the Douglas,

"Thanks to St. Bothan, son of mine,
Save Gawain, ne'er could pen a line."

But some of the Mirs, like Beauclerc, were scholars and even poets. And if they did not much patronise learning, they patronised the Sayads, who were the depositories of learning. Tatta and Rohri, where the Sayads enjoyed liberal allowances from the state, might be called the universities of Sind. In other places it was not an uncommon thing for a rich man to employ an *Akhund*, or tutor, for his children and allow the children of poorer neighbours to share the benefit. Pious scholars there were too who taught the "humanities" (not Latin and Greek, but Persian and Arabic) for the love of God and such fees as the children could bring on Fridays. Their incomes were supplemented by gifts on the *Id* and when a child had mastered the first ten lessons of the primer they would bind his hands with silk as a diploma and send him round to collect a "benefit" for the master. Persian was the language of literature and business, and not only Musalmans, but Hindus who hoped for government service, acquired it by these agencies. Besides these there were hundreds of *Maulvis* sitting on the platform of the village mosque, or under a tree, and teaching little boys and girls to read the *Korán* without understanding and receiving in return an allowance of grain at harvest time, with other humble perquisites. In 1853 the number of small schools of these kinds in the Karáchi, Hyderábád and Shikárpur Collectorates was reported to be over 600 and many must have escaped registration. There was, however, a need which they could not meet. Sindhi was the language of

common life among all, from the Mir to the Muhána, and though it was not considered a fit vehicle for learning, or polite correspondence, the Hindu traders kept their accounts and carried on all their business in it, using a Hindu character based on the Devanagri, of which there were several varieties. Having no vowel marks, it was extremely difficult to decipher except the reader knew what the writer was likely to mean, which no doubt made it more suitable for their purpose. There were a few Hindu schools for instruction in this, but for the most part the sons of men in business appear to have acquired their commercial education at home, or from neighbours. Such was the condition of learning under the Talpurs. The British Government confiscated the endowments, or stopped the allowances, of the Tatta Sayads, and British influence dried up to a great extent the spontaneous springs which had nourished the indigenous educational agencies. At the same time it created a new want: schools in which the English language could be learned became urgently necessary. Earnest executive officers, working under many difficulties, were the first to see the need and made efforts to meet it. Captain Rathborne, Collector of Hyderábád, moved in the matter as early as 1845, asking the Government of India to sanction an outlay of Rs. 3,000 a year. But questions were asked and difficulties were raised, a competent master could not be found, and finally, after three years' correspondence, the subject was dropped. Captain Preedy, Collector of Karáchi, went to work in a different way and was more successful. He founded the Karáchi Free School, apparently at his own expense, and in 1846 entrusted it to a local committee on the express condition that all instruction, as far as the subject permitted, should be given through the medium of Christian religious publications and that these should include the whole Bible. In 1853 this school was handed over, on the same condition, to the Church Mission Society, and it continues to this day, its principal hall being the original schoolhouse built by Captain Preedy in the compound of his own Kutcherry. At Shikarpur also an English school was started and kept up by the liberality of Captain Goldsmid. At last the Bombay Board of Education took up the question of organising an educational agency in Sind, and about the same time there was a movement in favour of making Sindhi the official language of

the Province, which involved the question of vernacular education. Few of the English officials could speak Sindhi and none of their Munshis could write it. The administration was carried on through interpreters and records were kept in mongrel Persian. In 1851 Mr. (afterwards Sir Bartle) Frere issued a circular requiring all officers in civil employ to pass an examination in colloquial Sindhi; but the language could not be used for official correspondence until it had an alphabet. Captain (afterwards Sir Richard) Burton strongly advocated the adoption of the Arabic alphabet, with such addition of dots and signs as might be necessary to indicate sounds, cerebral, guttural and pectoral, in which Sindhi is peculiar. Cantain Stack, his only equal in knowledge of the language and author of a dictionary of it in the Devanágri character, contended for the adoption of one or other of the Hindu-Sindhi alphabets already in use among traders, with similar modifications. The contention raged for some time and until the question was set at rest vernacular education could not even begin. Mr. Frere was of opinion that Hindus would not learn the one alphabet, nor Musalmans condescend to use the other. In 1853, however, the Court of Directors of the East India Company decided that the Arabic should have a trial and at the same time sanctioned an annual expenditure of Rs. 10,000 for educational purposes. Then Mr. Frere acted promptly. Mr. (afterwards Sir Barrow) Ellis, with the assistance of some native scholars, devised an alphabet extending the 29 Arabic letters to 52, which was printed and issued in July 1853, after which the preparation of school-books by translation from Persian, Urdu, Maráthi and Gujaráti, went on apace. In December, 1854, Mr. Ellis was able to report that 10 books on Arithmetic, History, Geography &c., were ready. An English school was opened at Karáchi in October next year, with 68 pupils (mostly not natives of Sind), school buildings were sanctioned at Hyderábád and Shikárpur, and smaller buildings for vernacular schools at 12 other towns. In other places assistance was promised from local funds. It is noteworthy that these measures were cordially seconded by the principal inhabitants, who in many cases promised ample contributions for the maintenance of the schools. The greatest difficulty in the way of immediate progress was the want of teachers. To meet this a normal school was opened at Karáchi in October, 1854, in which

instruction was imparted to such masters of indigenous schools and others as desired it, by old pupils of the Elphinstone and Poona Colleges who happened to be in Government Service in Sind. This was afterwards transferred to Hyderābād and is now the Male Training College. The outcome of all these measures was that ten years later, in 1864-65, there were 4 High Schools, 3 Middle and 56 Primary Schools and one Training College in the Province, of which 3 were aided and the rest maintained by Government. The number of pupils in all was 2,440. The quality, however, was not equal to the quantity, for in 1863 Mr. Mansfield, Commissioner in Sind, recorded his opinion that there were " only two decent English schools in the Province and not more than 5 or 6 vernacular schools". This is scarcely to be wondered at, for capable teachers could not be produced in a day, and men from other provinces, if obtainable, could be of little use in vernacular education. In 1863 a Local Fund was established and one-third of the cess on land was allocated to rural education, with the result that the next decade showed a great increase in the number of primary schools. Aided private schools also begin to appear in the reports, and girls schools, of which there were 20 in 1874-75. The total number of recognised institutions in that year was 230, with 14,299 pupils. A beginning was also made in extending recognition and assistance to indigenous schools, of which no less than 728 were recorded. In 1872 Mr. E. M. Fulton of the Civil Service had been appointed a full time Educational Inspector, a much-needed measure, for education could not receive the attention it required so long as it was only one of the bye-duties of busy officers, who were moreover subject to frequent transfers: in two years there had been four such changes. Mr. Fulton did good work till 1876, when he was removed and the old state of things began again. Consequently the decade from 1875 to 1885 was not marked by progress in efficiency, and in January, 1887, Mr. E. Giles was appointed on special duty to report on the whole subject of the condition of education in Sind. In the following July Mr. H. P. Jacob was appointed Educational Inspector in Sind and from that time the department has been continuously administered by officers of educational experience. Mr. Jacob, a nephew of General John Jacob, held the appointment until his death in 1895 and threw into his work that energy and thoroughness of which

his family name has been a symbol in India for two generations. An immense development of educational activity marked the decade of his administration (1884-85 to 1894-95.) The number of recognised schools rose from 375 to 1,616 and of pupils from 24,159 to 62,595. A large number of indigenous schools were brought into connection with the department, raising the list of Aided Primary Boys Schools from 51 to 978. The number of girls schools of the same class increased from 2 to 137, with 4,467 pupils. Other steps on the path of progress were the establishment of the Arts College at Karáchi in 1887, the founding of two aided High Schools, the transfer of numerous Middle and Primary Schools to municipalities, and the institution of four Normal, or Training, Colleges for women.

In the decade which has just closed education has been subjected to sudden and paralysing interruption by visitations of plague, but there has been progress all along the line except in Training Colleges and Technical Schools. The number of institutions maintained or recognised and aided by Government, with the number of pupils attending them, in 1904-05, is shown below:—

Class of Institution.	Under the management of Government or Local Boards.				Under private management.				Total.	
	Managed by Government.		Managed by District or Municipal Boards.		Aided by Government or by District or Municipal Boards.		Unaided.			
	Institutions.	Scholars.	Institutions.	Scholars.	Institutions.	Scholars.	Institutions.	Scholars.	Institutions.	Scholars.
Arts Colleges	...	...	...	...	1	165	...	...	1	165
High Schools	3	1,106	...	...	8	2,306	...	...	11	3,412
Middle Schools (English.)	...	...	1	27	3	215	...	...	4	242
Do. (Vernacular).	...	...	11	1,135	9	594	...	...	20	1,729
Primary Schools ...	1	146	564	32,914	780	30,486	..	...	1,345	63,546
Training Schools ...	2	134	2	15	2	11	...	...	6	160
Technical and other Special Schools.	2	68	1	111	4	93	2	29	9	301
Total ...	8	1,454	579	34,202	807	33,870	2	29	1,396	69,555

The total expenditure on education during the year is shown below.

Provincial funds.	District funds.	Municipal funds.	Fees.	Revenue of Native States.	Subscriptions.	Endowments and all other sources.	Total.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
3,94,938	1,97,101	82,379	1,56,465	6,000	50,300	1,45,422	10,32,605

ADMINISTRATION.

The Department is controlled, under the Director of Public Instruction, by the Educational Inspector in Sind, with four Deputy Inspectors at Karáchi, Hyderábád, Sukkur and Lárkána, and adequate teaching establishments in the Government Schools.

Under the system now in force, ordinary school education is classed as Primary, or Secondary. In the former the range of instruction comprises the infant course and seven standards. A child commences in the infant course with the numerals and the letters of the Arabic Sindhi alphabet : he is introduced to simple forms and colours and is exercised in songs, drill, games and some of the Kindergarten occupations, such as paper-folding, paper cutting, drawing and claymodelling. In the first standard reading, writing and the rudiments of arithmetic are taught, to which is added in the second standard the general geography of the Taluka. From this the child passes to the physical and political geography of his District and in the fourth standard commences the study of grammar, the history of Sind, the general geography of India and the physical, political and industrial geography of Sind. After completing this course a boy is allowed, if he wishes it, to commence the study of English. Standard V carries the pupil further in the subjects already opened. Euclid and sanitary science are reached in the sixth standard and the course ends in the seventh standard, leaving the pupil in possession of a practical knowledge of grammar, arithmetic, the first book of Euclid, the history of India, the general geography of the world and the principles of sanitary and elementary science. The completion of the course qualifies a boy for admission to the Public Service examination, through which he enters the Government service or the Training College. In schools established in the smaller villages the full

course of seven standards is replaced by a shorter or 'rural' course consisting of five standards and adapted primarily to the requirements of the agricultural classes. Thus, instead of learning grammar and history, a boy is instructed in agricultural lessons, the Hindu Sindhi character and the method of shopkeepers' accounts. In other respects the tuition differs little from that given in the same standards in schools teaching the full course. After completing 4 standards in the Primary Course, as has been said, a boy may begin the study of English by entering the Secondary Course, which comprises seven standards, of which the first three, known as the Middle School course, lead the pupil by easy stages to the High School course, standards IV to VII, in which English is the medium of instruction. The seventh standard of the Anglo-Vernacular course is the class in which students are prepared for the Matriculation examination of the Bombay University.

Schools which impart instruction in the vernacular according to the Primary course are classed as Primary, and those in which the standards of the Secondary course are taught are classed as Middle Schools unless they prepare pupils for entrance to the University, in which case they rank as High Schools.

For English Schools, that is, schools intended for European children, in which the medium of instruction is English from the beginning, there is a distinct course comprising 8 standards and ending, if they rank as High Schools, with preparation for entrance to the University.

There are in Sind only 8 Government Schools, supported from provincial revenue, namely three High Schools at Karáchi, Hyderábád and Shikárpur, one Primary School at Hyderábád and two Training and two Special Schools, the former being at Hyderábád and the latter at Hyderábád and Karáchi. The special school at Hyderábád is the Medical School and that at Karáchi merely a Saturday afternoon class for teachers. The duty of making provision for primary education devolves in municipul towns upon Municipalities and in rural areas on the District Local Boards. Besides the schools provided, under law, by these three agencies, educational institutions of all grades, from colleges to kindergarten schools, may be maintained by societies and individuals. From the table given above it will be seen that

these private schools are numerous and run the public schools very close in the number of children that they educate. It is the policy of Government to encourage private enterprise in education, with which object pecuniary assistance, called "grants-in-aid", is given to all such schools if they conform to the prescribed courses of study. The grants-in-aid are assessed according to the number of pupils found proficient in the various standards at an examination conducted periodically by the Educational Inspector and his deputies.

The schools classed as "Special" in the tabular statements are such as Medical, Engineering and Agricultural Schools. The only Medical School in Sind is at Hyderábád, where men are trained for the subordinate medical service. There are Agricultural Schools, or classes, in the same town and an Engineering Branch in the Dayárám Jethmal Sind College at Karáchi which leads to employment in the Public Works Department. These and others are described in the B Volumes of the several Districts.

In several girls' schools situated in the large towns of the Province, Gurmukhi is taught in addition to Arabic-Sindhi. The religious books of *Nának Panthis,* who form a large portion of the Hindu population of Sind, are written in that charactor, hence the demand for this instruction. Many girls, however, learn Gurmukhi in their own homes. There are besides some Maráthi and Gujarati schools in Karáchi, elementary Sanskrit schools at Hyderábád and Shikárpur, a Devanágri school at Tatta and another at Karáchi. There are very few purely Hindu Sindhi schools, but Hindu Sindhi is taught in some schools in addition to Arabic-Sindhi, especially, as has been said, in Local Board rural schools. In High Schools Persian, or Sanskrit, or some other classical language, though not compulsory, is often chosen for the Matriculation examination in preference to a vernacular, because a classical language is part of the curriculum for University degrees.

In early reports on the subject of Education the Musalmans are represented as being more eager for it than Hindus ; but when it became the avenue to employment in Government service, the latter availed themselves of it far more eagerly than the former. How completely the Hindus have distanced the Musalmans now the Tables in Volume B will show.

LITERACY.

Table XXIX.—A exhibits the percentage of literates (*i. e.* persons who can read and write) in each District. The figures for the whole Province are given below.

Principal Religions.	Population.			Literate.			Percentage of Literate to Total Population.		
	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male	Female
Hindu	7,51,252	4,11,664	3,39,588	70,222	65,349	4,873	9·3	15·8	1·43
Musalman	24,46,489	13,41,878	11,04,611	18,177	17,038	1,139	·74	1·26	·1
All other Religions..	13,169	8,248	4,921	6,074	4,569	1,505	46·1	55·3	30·6

It is unfortunately impossible to form an accurate estimate of the progress that has been made in education since the last census owing to a change in the system of classification. In the census of 1891 there were three heads, *viz.* Literate, Illiterate and Learners. It is evident that the third head must have included a good many who had advanced in their learning so far as to be able to read and write, but there was no means of judging how many they might be ; therefore the third head was abandoned in the census of 1901, and we can only compare the literates of 1901 with the literates who were not still pursuing their studies in 1891. This ought of course to make the apparent progress achieved in the decade seem greater than it really was, and yet a comparative statement in the Census Report shows a distinct decline in the proportion of literates in every District of Sind except Hyderábád. It is difficult to account for this humiliating revelation. If we attribute it to a more accurate enumeration of women and children, we are opposed by the fact that the decline is greater among males than among females. No other explanation suggests itself, unless it be that the expectations, or enthusiasm, excited by the first offer of educational facilities is gradually waning, while the extension of agriculture and the ease with which a living can be earned by unskilled labour is removing the pressure which forces men to seek new paths. Of the 94,473 persons who can read and write, 78,099, or about 83 per cent, read and write Sindhi and 12,152, or 13 per cent, English. The highest percentage which the Table in the B Volumes shows is found among the Hindus of the Upper Sind Frontier. The reason

for this is obvious: the Hindus of that District are a small minority of the population engaged for the most part in trade or service. In Thar and Párkar, with its mixed multitude of low caste Hindus, only 4 in 100 of the men can read and write and only 4 in 10,000 of the women. Only 3 in 1,000 of the Musalman males in the same District can read and write, while the column does not provide space for the number of decimal figures that would be required to express the percentage of females. Among the Musalmans of other Districts about one in a hundred can read and write, except in Sukkur, where the percentage is two. The number of literate women is very small everywhere, especially among the Baluchis of the Upper Sind Frontier. The classes grouped under Other Religions are so heterogeneous that the figures have no value: they include Christians and Parsees, among whom there are few unable to read. Upon the whole Sind compares very unfavourably with the rest of the Bombay Presidency in the matter of education. The highest proportion of literates in Sind at the last census was 56 per 1,000 males in the Karáchi District, while the lowest in the rest of the Presidency was 80 in Satara. The Brahmans appear to suffer most by comparison. Only 4 per cent. of the Brahmans in Sind can read and write Sindhi, which is just the percentage of Gujarat Brahmans who can read and write English. A larger proportion, 12 per cent., could read and write some other language, which seems to show that the more literate persons of that caste are generally not natives of the Province. Many of them may be wandering ascetics from the north. The largest proportion of literates was found among the Vánis (Banias) of Gujarat and the Gujarat Brahmans, the language of course being Gujarati. In Sindhi the Amils took the lead, showing a percentage of 27 literates among males and one among females. The Lohánas and Bhatias came next.

LITERATURE.

Until near the end of the eighteenth century, when the Talpurs had come into power, there was scarcely such a thing as vernacular literature in Sind. The Sindhi language could scarcely, in fact, be called a written language at all: it had no alphabet except the adaptations of the Devanágri character used by Banias for their accounts. Persian held the place once held by Latin in Europe as the language of science and letters. In connection with that fact there is another worth noting, whether it

be regarded as cause or effect, *viz.* that there is scarcely a composition of that time extant of which the author was a Hindu, or even a native Sindhi in the strict sense. The historians, poets and philosophers were all descendants of invaders, or immigrants, from Persia, Afghanistan, or Central Asia, and the time when Sind was under the rule of the Arghuns and Tarkhans was the Elizabethan age of its literature. Dividing that literature under the heads, History, Theology and Poetry, we may take History first, for it is by far the most important to us : without the Sindhi historians we should have known little of the history of Sind.

HISTORIES. The earliest history by a Sindhian writer is the one commonly known as the *Chachnáma,* from Chach, the great Brahman king of Sind who ruled in the middle of the 7th century, because it celebrates the conquest of his kingdom by the Arab Muhammad Kasim. It professes—and there is no reason to doubt the statement—to be a translation of a much earlier Arabic work of unknown authorship. The translator was Ali, son of Hamid, son of Abu Bakr Kufi, an alien who, after many wanderings, had settled in Uch during the reign of Nasir-ud-din Kabacha, in A. D. 1216. Of this work Elphinstone says that, "though loaded with tedious speeches and letters ascribed to the principal actors, it contains a minute and consistent account of the transactions during Muhammad Kasim's invasion and some of the preceding Hindu reigns." It has been carefully translated into English by Mirza Kalichbeg Fredunbeg.

The next history is the Tárikh-i-Maásumi, or Tárikh-us-Sind, by Mir Muhammad Maásum, a native of Bukkur who rose to considerable power and fame in the days of the Emperor Akbar, and whose minaret is the most conspicuous object at Sukkur, where his descendants still live. His book was written in 1600 A. D. and contains a history of Sind from the Arab conquest to his own time. It is the fullest account of the whole period that we possess. There is a literal English translation of it by Captain G. Malet, once British Resident at Khairpur.

The Tárikh-i-Táhiri, composed about 1621 A. D., is a history of the period from the rise of the Sumras to the death of Ghazi Beg Tarkhán. The last part is very full, being concerned with events in many of which the author's father had a share ; but it

is confused and inaccurate. There appear to be a number of copies of this work in Sind, but Elliot says that it is rare elsewhere.

The Beg-lár-náma is an anonymous book dedicated to one Sháh Kasim Khán, whose father settled in Sind in the days of Mirza Sháh Husain Arghun, and is occupied mainly with court scandal and the public events, great or small, in which the author's patron played a part. It was written about the same time as the last. Copies are rare.

The Tarkhán-náma is a genealogyand history of the Arghuns and Tarkháns, compiled from the Tarikh-i-Maásumi (without acknowledgment) and some other sources, by Sayad Jamál Shirázi in 1654-55.

The Tuhfat-ul-kirám is a work in 3 volumes, of which the last constitutes, according to Elliot, the most comprehensive and consistent history of Sind that we have. It was completed not earlier than 1774 A. D., by Alisher Káni of Tatta, and so includes all the conflicts that attended the expulsion of the Kalhoras by the Tálpurs, but narrates them of course in a manner calculated to be pleasing to the Tálpurs.

The Fateh-náma is a metrical history of the beginning of the Tálpur rule, written by one Muhammad Azim of Tatta and dedicated to Mir Fateh Ali Khán.

RELIGION.

Works in theology, or religious philosophy, were probably very numerous. Besides religious teachers many men of note in other ways devoted their leisure to this kind of composition. Both the Arghun kings are said to have written commentaries and other religious books. But little is known of such of these works as may still be extant, except among Sayads, *Maulvis* and other Musalmans who combine piety with learning.

POETRY.

Composing poetry was a proper amusement in the olden time for all who made any profession of Persian scholarship. Even the Mirs made verses, or kept a courtier who could do it for them. But the only poets whose works have lived composed in the Sindhi tongue. That it should have been used for poetry long before prose composition was attempted in it may be explained by the consideration that the poetry was not intended to be written and read, but recited or sung. The first vernacular poet of any note appears to have been Sayad Abdul Karím, the saint of Bulri.

He composed a religious *Risálo* in couplets which are said to have become the model for all subsequent aspirants to poetic fame. But his best claim to distinction is that he was the great-great-grandfather of Sayad Abdul Latíf, whose mausoleum at Bhit, 4 miles from Hala, where he taught and died, is visited still by the devotees of his genius and sanctity. His death occurred about 1750 and he was then between 60 and 70 years of age. It is difficult to be more precise. His *Sháh-jo-Risálo* has taken a hold on the people of Sind which makes it impossible to doubt his genius. It consists of pieces, the number of which varies in different copies and the authenticity of some of which is doubtful, but of which many are said to be exquisite in their beauty of thought and expression. Some are love songs, some inculcate doctrines savouring of "christian science" and some tell over again in sweetest verse old, old stories that have been told in Sind for centuries ; but the poet was a *Súfi* mystic and his disciples see spiritual meanings running through them all. These stories have an interest of their own apart from the poet's dressing, for the burden of most of them is the sad truth that the course of true love never did run smooth, a truth for the illustration of which neither the Musalman nor the Hindu social system appears to offer much scope. But probably all these stories had their origin among the Rájput races of Sind and are older than their conversion to Mahomedanism. The best known perhaps is the story of Punhun, the prince of Kech who fell in love with Sasui, the lovely daughter of a washerwoman, and engaged himself to her father as a servant that he might always be near her. He could not wash clothes, but she helped him and they were too happy for mortals. Then his relations, ashamed of the base alliance, came from Kech and carried him off. She followed him inconsolable till she came to the Pab hills, where, falling into danger and growing desperate, she prayed heaven to shield her and was forthwith swallowed up by the kindly earth. Punhun, unable to live without her, escaped from his unkind friends and followed her tracks until he reached the spot and knew by subterranean voices what had happened. Then he cried to the earth to swallow him too and it did. The story of Suhni is another favourite. She was a potter's daughter and, because her highborn lover Mehár could not come to her, she crossed the river nightly floating on a chatty (her father's best make) to meet

him. Her friends were angry and substituted an unbaked chatty, which melted midstream and delivered her to a watery grave. Her lover plunged after her from the other bank and was drowned too. The stories of Mumal and Ráno and of Kánru and Chanesar are distinctly of Rájput origin. Ráno was in fact a Sodha of Umarkot and the ruins of Mumal's Mahal are near that town. These stories are too long for insertion here and would suffer by abridgement. They are sung in other versions than that of Abdul Latif and are very popular. It is likely enough that many of the compositions of the minor poets of Sind mentioned above survive in the *káfis* and *ghazals* sung or recited by strolling bards all over the country, though no written copy of them may be in existence. It is a pity that so little has been done to collect these and save the best of them from oblivion.

RECENT LITERATURE.

The education of the country by British methods has called forth a plentiful crop of literature of a different order. School books and translations, or adaptations, of English works of course predominate, but some useful work has also been done in dressing in a Sindhi garb samples of good things from Sanskrit and Persian literature. Mirza Kalichbeg Fredunbeg has been especially fertile in these departments, and has also produced a large number of original works, while he has laid those who do not know Sindhi under obligation by a translation into English of the *Chachnáma* already mentioned, and a History of Sind which is a translation of selections from the Tárikh-i-Maásumi and the Tuhfat-ul-kirám. The new education has also brought Hindus into the field, among whom Mr. Dayárám Gidumal, Mr. Lilárám Watanmal, Mr. Kauramal Chandanmal and many others have given their countrymen both translations and original compositions. Missionaries have, as usual, been well to the front. The New Testament, part of the Old Testament and the Pilgrim's Progress have been translated, mostly by the late Rev. G. Shirt, whose Sindhi Dictionary is still the standard work, though published 27 years ago. To pass on to more ephemeral literature, there are now many newspapers in Sind, both English and Vernacular, some old and well established, some of mushroom growth. But as these are local institutions, they will be noticed, as will also the public Libraries, in the B Volumes of the Districts concerned.

CHAPTER XIII.

HEALTH.

Tables XXX A and B, XXXI, XXXII and XXXIII.

Vital Statistics.

Vital Statistics.

For some time after the British occupation the climate of Sind was believed to be preeminently unhealthy. Our first experiences of it were unhappy. When the army for Afghánistán was passing through the Province in 1839 the sickness in the camp at Tatta was so terrible as to leave no doubt in the popular mind that the whole of the lakh and twenty-five thousand Pírs buried on the Makhli hill had been stirred to vengeance by the desecration of their tombs ; and in the autumn of 1843 more than two-thirds of Sir Charles Napier's forces were prostrated. But ampler experience has shown that Sind is, upon the whole, a healthy country. From Table XXX-A it appears that in Karachi, which has a higher death rate than any other district, the average annual number of deaths per 1,000 of the population during the five years since the last census has only been 27·5, which is lower than that of any district in the Presidency excepting Ratnagiri and less than half that of some districts. It will be well, however, before examining the vital statistics given in the Tables, to utter a word of caution against putting too much trust in them. In the large towns the registration of births and deaths has been made compulsory by a bye-law under the Municipal Act, and though the penalties for non-compliance are rarely enforced and the *ex officio* Registrar is the Municipal Secretary, who has more than enough of other work, there is an ideal of efficiency. In the country there is not even that. Nobody is obliged to report a domestic occurrence and the source of all vital statistics is village gossip. The person responsible for collecting them is the Tapedár, but he cannot always attend to this duty personally and must entrust it to his peon. In some villages registers are kept by school masters, or shopkeepers, who enter all the births and

Vital Statistics.

deaths of which they hear. The information thus collected is gathered up every month by the Tapedár and submitted to the Deputy Sanitary Commissioner. The system is not materially different from that which obtains in the rest of the Presidency, and until it becomes possible to introduce a more effective machinery the results must be, as the Deputy Sanitary Commissioner describes them, "widely inaccurate." To incompleteness must be added certain sources of positive error, such as ignorant suspicion among the lower orders, and among the higher reluctance to talk about matters of the zenana. These causes will affect the births more than the deaths and the female statistics more than the male, while the vague ignorance of all classes about diseases discredits all figures relating to causes of death. It is vain therefore to attempt to deduce precise results from the Tables, but a few general conclusions may be drawn, bearing in mind three circumstances, *viz.*

1. That the figures of the first five years are based on the census of 1891, but those of the last five on that of 1901. This ought to cause a sudden fall of percentages in 1891.

2. That there was a severe famine in Thar and Párkar in 1898 and 1899, which led to a great immigration of starving and sickly people into the Karáchi and Hyderábád Districts.

3. That the Karáchi, Hyderábád and Thar and Párkar Districts suffered from severe visitations of plague and cholera in certain years which are indicated in the Tables.

With respect to the first of these circumstances, if we take the district least disturbed by plague and cholera, that is the Upper Sind Frontier, we find the birth rates for the first and second quinquennium to be 28·26 and 21·6 respectively and the death rates 21·1 and 15·1. The second figure in each case, as being based on the census of 1901, is as near the truth as we can hope to get, and it follows that the first is worthless. The first quinquennium may therefore be ignored. With respect to the second and third disturbing causes it will be observed that the Karáchi and Hyderábád districts suffered from plague, or cholera, or both, in every year of the second quinquennium, and the effect cannot be satisfactorily eliminated, because an epidemic always causes a temporary exodus which reduces the mortality under all other heads. It is also well known that, during a

Vital Statistics.

plague epidemic, and especially at the beginning of it, hundreds of deaths by plague are reported as due to simple fever. It will be seen however, from Table XXX-B that, except in the towns of Karáchi and Jacobabad, the percentage of deaths by plague on the total mortality nowhere amounted to one per cent in 1905, which was one of the worst plague years. We may therefore regard that disturbance of the normal death rate by these causes in any whole District as insignificant and take the figures as they stand. We get the following averages for the several Districts during the years 1901—05 :—

	Births per mille.	Deaths per mille.
Karáchi ...	... 23·5	27·5
Hyderábád ...	... 18·1	18·8
Sukkur ...	... 26·2	20·4
Lárkána ...	... 24 1	22·3
Thar and Párkar	... 15·3	20·6
Upper Sind Frontier	... 21·6	15·1

The high death rate of the Karáchi District must in part be attributed to the plague which raged in Karáchi town every year of the five under review and was responsible for half the deaths registered. But the town is not the District and we must look elsewhere for the chief cause of the high mortality of this District and, after it, of Lárkána and Sukkur. Column 10 in both Tables shows that "fever" swamps all other causes of death in Sind, as it does in India generally. Any death preceded by a high temperature is sure to fall into this column unless the reporter is a qualified and careful medical man; but it may be taken for granted that in the great majority of cases the fever indicated is really malarious fever. Now the Karáchi District includes certain Talukas, annually flooded by the Indus and covered with rice cultivation, which at the end of the inundation, when the water has ceased to flow and is standing stagnant in the fields and ditches, are almost uninhabitable owing to mosquitoes. It is recorded that, when the Emperor Firoz Taghlak of Delhi beseiged Jám Babinah in his fort at Samui near the present Tatta, the mosquitoes forced him to raise the seige and retire. Similarly we have in the Sukkur District the rice-growing Talukas of Shikárpur and Naushahro Abro, and in the Lárkána District, Kambar, Kakar and Ratodero. And though the death rate for the whole district is not so high in Thar and Párkar as

in Karáchi, there are certain Talukas in which camels cannot be kept during the monsoon on account of the plague of mosquitoes and in which the deaths from fever amount to 20 or 22 per 1,000. In the Upper Sind Frontier, Shahdádpur (a rice Taluka) and the town of Jacobábád are instances of the same thing, but the desert Talukas like Kashmor keep the district average down.

Vital Statistics.

A comparison of the birth and death rates in the different Districts would be instructive if the figures could be trusted. The low birth rate in Thar and Párkar is largely explained by the fact that a large part of the population consists of temporary immigrants looking for work, but it is in this District that the arrangements for registration are worst and we may assume that a very large number of births pass unregistered. In the Upper Sind Frontier District also a good proportion of the population consists of recent arrivals; but they come to settle and the home-born population of the district is increasing from year to year. The District in fact presents just the conditions which are favourable to longevity and a high birth-rate.

PRINCIPAL DISEASES.

Principal Diseases.

FEVER.

Of the causes of death shown separately in the Tables, fever, as has already been said, preponderates not only over every other single cause, but, in a normal year, over all others put together. To what has been said about it above it will be enough to add that the ratio per 1,000 of deaths from this cause during the last five years was higher in Lárkána and Thar and Párkar than in any other Collectorate within the Bombay Presidency, except those included in the Gujerat Registration District under the Sanitary Commissioner. The mortality varies much from year to year in response probably to the extent and character of the inundation. The most fatal period is from October, or November, to February, or even March, inclusive. The other diseases separately noticed are Plague, Cholera, Small-pox, Bowel Complaints and Respiratory diseases.

PLAGUE.

The Plague was first recognized in Sind on 8th December, 1896, when a Brahman cook in Karáchi city was found with unmistakeable symptoms of it. He died next day. Several similar cases followed and on the 29th the Medical Board declared plague to be epidemic in Karáchi. Since October measures

Principal Diseases.

had been taken to enforce quarantine in the port against passengers from Bombay, but no cases had been detected and it is not known how the disease was imported. It had probably existed for some time before it was detected. Quarantine was unavailing now and vigorous measures were at once taken to combat the enemy on the spot by disinfection and segregation. To attempt to enforce segregation by means of a Hindu municipality on a population principally Musalman, was likely to prove as futile as dangerous and it was decided to try conciliatory methods. By degrees these succeeded so well that health camps and temporary hospitals were resorted to by increasing numbers. A Military and Police cordon prevented refugees from the city carrying the infection into the bazaar and cantonment, and medical inspection of passengers by rail was instituted at Karáchi and other principal stations. But in the old town the disease spread faster than the army of inspectors and disinfectors could follow it. In the first week of January the deaths from plague were 103 and in the first week of February 295. This was the climax, but the weekly death-rate did not fall under a hundred until the end of April. In that month the scattered population began to return to their homes and in July the epidemic was at an end. The mortality by months had been as follows :—

December 1896	59
January 1897	743
February	995
March	864
April	538
May	167
June	23
July	9

The total number of deaths had been 3,398 and the percentage of deaths to cases 81·27. The toil and anxiety borne by officers of almost every department and by many volunteers cannot be described. The money expended from municipal funds amounted to Rs. 1,84,595 and from provincial revenues Rs. 1,27,734. In the Karáchi District outside of the town there were only 178 deaths, of which 41 were in Tatta, 25 in Kotri and 17 in Jungsháhi. In Hyderábád there were occasional cases imported from Karáchi in spite of all vigilance until the end of February, when

Principal Diseases.

it became clear that the disease had established itself. Segregation of the sick and evacuation of infected houses were enforced with more stringency than in Karáchi and regular house-to-house inspection was carried out, and though the number of cases increased rapidly for six or seven weeks, a rapid decline set in after that. The climax was in the middle of April, when there were 117 to 119 cases per week. By the middle of May they had fallen below 10 and in June there were only two cases. The total number of cases was 586 and of deaths 451, showing a percentage of 76·96.

At Sukkur the first case came to notice on 12th February. Here the people banded together to defeat the authorities, concealing their sick, or removing them to the surrounding villages. About 10,000 people are said to have fled from the town. As far as it could be traced, however, the disease appeared to follow very much the same course as it had done in Hyderábád, reaching its climax in about seven weeks and disappearing at the beginning of June. There were 537 cases recorded and 391 deaths, which gives a percentage of 72·81. The decline in virulence as the disease travelled north is curious. Owing to the reckless flight of the people it had spread very soon to Rohri, where there were 151 cases, and to many other parts of the District, but by unremitting vigilance it was kept out of Shikárpur: Lárkána also escaped with a few cases. In the Upper Sind Frontier and Thar and Párkar there were only 3 and 2 deaths respectively. The cases in the whole Province were 6,420 and the deaths 4,829.

As Table XXX-A shows, the plague has re-appeared in Karáchi every year since, but in fatality its first visitation is still the record. It begins with remarkable uniformity about the end of the year, reaches its climax in April and almost, but rarely altogether, disappears in June. It usually spreads to 15 or 20 of the villages or small towns in the District. In Hyderábád also it has been an annual occurrence, but the visitations have varied much in their severity. In 1901 the disease only appeared for seven weeks in April and May, carrying off 26 persons; but after a similar short passage in the year 1899 it re-appeared in August and remained till the May following, destroying 946 persons. In 1902, when it remained from January till May, there were 1,308 deaths, after which there was another outbreak in

Principal Diseases.

August. The great bulk of the cases are always in Hyderábád city, but the villages do not altogether escape. Upper Sind and the Desert have enjoyed practical immunity from plague since the first year, except in 1905, when there were 19 cases in Sukkur, 28 in Lárkána and 73 in the Upper Sind Frontier. As a whole the Province has been very lightly touched by this pestilence in comparison with other parts of the Presidency. In no District excepting Karáchi has the number of deaths by plague per 1,000 of the population reached one on the average of the last five years, and in Karáchi it has been only 6, while Bombay records 20·85, Dharwar 24·73, Belgaum 22·76, Satara 19·43 and many Districts from 7 to 12.

CHOLERA.

Cholera visits some part of the Province every few years with more or less severity. There have been four such visitations during the last decade. In 1899 Cholera had been present for some months in Bombay and had begun to assume a very serious aspect in Belgaum and Dhárwár when, in March, a case was reported in Karáchi. Next month there were 10 deaths and in May 1,804. After this it declined and in October it had disappeared, leaving a record of 2,394 fatal cases. In the following year there was a far more serious outereak. Isolated cases first appeared in the town and cantonment of Karáchi, where they may have orginated from germs of the previous year. But almost simultaneously there was an outbreak at Umarkot, where the fire found fuel in plenty. The terrible drought of 1899-1900 had driven nearly a lakh of starving and sickly people into the Nára Valley from the desert, among whom the disease is supposed to have been imported from Jodhpur. It rapidly spread, especially among the crowds employed in relief works, and passed into the Hyderábád District and on through a large part of Sind. The Sukkur District was almost unaffected and the Upper Sind Frontier escaped with 253 deaths, but in the Hyderábád District there were 5,961 and in the Karáchi District 3,783. The total mortality in Sind was 15,363. The disease continued until the end of the year, but the next year was quite free. In 1902 there was again an outbreak beginning in Karáchi in May. In June it got into Hyderábád, and in July 1,676 fatal cases were recorded there. It was practically confined to these two Districts and entirely ceased by November, the total mortality having been 3,081. In the following year the disease

invaded Sind from the opposite quarter, appearing first at Thul in the Upper Sind Frontier and at Shikárpur, to which places, it seems, some pilgrims had returned from Hardwár. It spread to Sukkur, Rohri, Lárkána and Hyderábád, carrying off 1,752 persons. The Karáchi District and Thar and Párkar escaped. **Principal Diseases.**

SMALL-POX.

Small-pox is never absent from Sind, and though the mortality from it fluctuates a good deal, it has never been very high in recent times if judged by Indian standards. The average number of deaths per 1,000 in the Karáchi District, in which it usually makes most havoc, is only ·28. It is lowest in Thar and Párkar.

BOWEL COMPLAINTS.

The causes of death classed under Bowel Complaints, which are chiefly diarrhœa and dysentery, appear to be much less potent in Sind than any other part of the Presidency, owing perhaps to the lowest classes being better fed. In no District do the deaths from these causes amount to one in a thousand of the population per annum. In several Districts in other parts of the Presidency the average is 10 per 1,000.

DISEASES OF THE RESPIRATORY SYSTEM.

The percentage of deaths from diseases of the respiratory system, as will be seen from the tables, is still smaller, except in the large towns, especially Karáchi and Hyderábád.

INJURIES.

Under "injuries" most interest attaches to deaths from wild animals and snakes. With respect to the latter Hyderábád generally takes the second or third place among all the districts of the Bombay Presidency, and Lárkána is not far behind it. Some information about the species of serpents and wild beasts concerned will be found in the articles on those subjects in Chapter II. There are few dangerous beasts in Sind now, even the wolves being less homicidal than they are in central and northern India; but crocodiles kill 8 or 10 persons per annum.

Vaccination.

Vaccination.

Vaccination in Sind is under the Deputy Sanitary Commissioner, Sind Registration District, and his Inspectors of Sanitation and Vaccination, of whom there are six, besides a special officer for Karáchi designated Superintendent of Vaccination and Registrar of Births and Deaths. Under these are numerous vaccinators, one as far as practicable to each Taluka.

In the town of Karáchi vaccination was made compulsory as long ago as 1879 by a special enactment (Bombay Act IV of

Vaccination.

1879) in accordance with which it is provided with "Public Vaccine Stations," Vaccinators and a Superintendent, all controlled by the Deputy Commissioner of Sanitation. Calf lymph is employed at the vaccine stations and this, or "tube lymph," whatever its source, is much more acceptable to the people than human lymph taken directly from a vesicle. In the towns of Sukkur, Rohri and Lárkána vaccination has been made compulsory more recently, at the request of the Municipalities, by a Notification bringing Act I of 1892 into force. In Hyderábád and all the rest of Sind the progress of vaccination is still dependent on such persuasive arts as the vaccinators are able to practise, assisted by the Mukhi of the village. They are expected to visit every village once a year at least, vaccinating the infants. Human lymph is used, the parents of the subject being propitiated with a small fee if the child is taken out of its own village. The vaccinators are paid from Local Funds, but the Municipalities maintain their own vaccinators. The Tables sufficiently indicate the work that has been done by the Department during the last ten years and show that in that time there has been no general progress and in many places distinct retrogression. This is especially noticeable in Hyderábád. The Upper Sind Frontier is indeed the only District in which there has been a marked increase in the number of vaccinations since 1895-96. The Sanitary Commissioner's report for 1904-05 states that opposition to vaccination is increasing amongst a section of the educated classes, and that there is almost universal opposition to re-vaccination. Hyderábád is the centre of this movement.

But the principal cause of the decline in vaccination during the last decade was the plague. Immediately after the first outbreak in 1896-97 the Deputy Commissioner of Sanitation was put on special duty in connection with that disease and vaccination was in abeyance in many places for months together. During the last three years, in which plague has been almost entirely confined to Karáchi and Hyderábád, the number of cases of primary vaccination has increased rapidly, and in 1905-06 it reached the satisfactory total of 99,535, the highest on record.

Inoculation for plague has never made any way in Sind. Attempts to introduce it met with opposition from the beginning. In 1905 the Karáchi Municipality resolved to offer a pecuniary inducement to the menials in their employ, especially the sweepers. At first a

month's pay and afterwards one rupee to each member of the man's family who submitted to inoculation was offered and paid. This led to the inoculation of 1344 persons and the results were most satisfactory, the percentage of plague cases among the inoculated during the following season being only 0·32, while it was 8·33 among those who remained uninoculated; but this had no apparent effect in encouraging others. In fact even those who submitted to inoculation were sometimes found trying to squeeze out the vaccine as soon as the operation was over, which showed that they had not been actuated by any faith in its effects.

Vaccination.

Hospitals and Dispensaries.

Hospitals and Dispensaries.

Full details of the working of the Hospitals and Dispensaries in each District are given in the Table and some account of the principal institutions will be found in the notes on it in the B Volumes. There are in the Province four Hospitals with Civil Surgeons in charge, at Karáchi, Hyderábád, Sukkur and Shikárpur,* and three Hospitals for women in Karáchi, Hyderábád and Shikárpur, at which there are qualified Lady Doctors.

In the other Districts there are only Dispensaries with Hospital Assistants and in some cases Licentiates of Medicine and Surgery in charge. Besides those maintained by Government and Municipalities and Local Boards, there are Railway Dispensaries at many of the principal stations. Of Veterinary Dispensaries there are five, at Karáchi, Hyderábád, Naoshahro, Shikárpur and Lárkána.

* The removal of this Hospital to Lárkána is contemplated.

CHAPTER XIV.

ADMINISTRATION.

Sind is a non-regulation Sub-Province under a Commissioner, with considerably larger powers than those of an ordinary Commissioner of a Division. Under certain Acts he has the powers of a Local Government, while under others he has powers which, in the rest of the Presidency, are exercised by heads of Departments such as those of Customs, Salt, Opium and Abkari. Sind is nominally a Scheduled area, *i. e.*, it is not necessarily brought within, or is from time to time removed from, the operation of the general Acts of the legislature, and the jurisdiction of the ordinary courts of judicature. After the battle of Miani (on 13th March 1843) Sir Charles Napier was appointed Governor of Sind, in direct subordination to the Government of India, and the system of semi-military administration which he organised has been described in the chapter on History (pages 140, 141). He divided the Province into three Collectorates, namely, Karáchi, area 16,000 square miles; Hyderábád, 30,000 square miles; and Shikárpur, 11,532 square miles. The Shikárpur Collectorate embraced roughly the whole of the present Sukkur, Upper Sind Frontier and Lárkána Districts, except the Talukas of Dádú, Johi and Sehwán, while Hyderábád included Thar and Párkar, though the southern part of the Desert, embracing the Mithi, Diplo and Nangar Talukas, remained nnder the Political Agent at Bhuj until some time between 1856 and 1858. The officer in charge of each District was called a Collector and had under him Deputy Collectors, of whom there were 16 in all. No immediate change was made in the designations or jurisdictions of these officers when, on the retirement of Sir Charles Napier in 1847, the Province was put under a Commissioner subordinate to the Bombay Government. Before that, however, the foundations of the Upper Sind Frontier District had been laid by the appointment of Major John Jacob, in

January 1847, to the command of the Frontier. There appears to have been no express declaration of his jurisdiction, powers or duties, but the last were for a time quite as much political as administrative, or military, and long after the region under his control became a regular District the officer in charge of it was not only the revenue administrator but continued to be the Political Superintendent, holding also the post of Commandant in Chief, Sind Frontier Field Force. In 1858-59 the southern Talukas of Thar and Párkar above mentioned had been transferred from the control of the Political Agent at Bhuj and were administered by the Collector of Hyderábád; but that year had scarcely expired when a mutinous rising at Nangar Párkar (see page 139) showed that a mistake had been made in placing the wild people of the Desert under an authority so remote. Moreover, the constant irruptions of marauders from Jaisalmer, Márwár, Gujerát and Cutch and the increasing immigration from those States into the region commanded by the Mithrau Canal, then under construction, involved much work of a political nature. The whole of the Desert was therefore detached from the Hyderábád Collectorate on 1st August, 1860,together with the country included now in the Umarkot, Pithoro and Sánghar Talukas, and constituted a Political Superintendency under Captain Tyrwhitt, an officer whose memory is associated in the traditions of Sind with many eccentricities, but who was described at that time as "able, energetic and possessing an astonishing degree of insight into the characters, habits and feelings of the border tribes." In August, 1881, the designation of his appointment and that of the Superintendent, Upper Sind Frontier, were changed by an order of Government into that which they have borne ever since, namely, Deputy Commissioner, and at the same time the Military and Civil duties were separated on the Frontier of Upper Sind. The Collectors and Deputy Commissioners, with their Assistants, formed until 1890 a distinct service known as the Sind Commission, consisting of Military and uncovenanted officers, with as a rule a single covenanted civilian in their ranks. In that year a scheme, sanctioned by the Secretary of State for India, for the gradual extinction of that service and the administration of Sind through the Covenanted Civil Service of the Presidency, came into operatien. No appointments of Military or Uncovenanted Officers have been made since and all vacancies

occurring in the Commission have been filled by members of the Imperial Civil Service. These retain their places in the Presidency list and their pay and promotion are regulated accordingly; but they enjoy a Special Sind Allowance of Rs. 100 a month for a Collector, or First Assistant, and Rs. 50 a month for an officer below a First Assistant. No allowance is attached, however, to the two Deputy Commissionerships, which are still special appointments with fixed pay. There are at the present time only two members of the old Sind Commission remaining in the service. These are Mr. H. C. Mules, M. V. O., Collector of Karáchi, and Mr. M. D. Mackenzie, Deputy Commissioner of Thar and Párkar.

From time to time changes have been made in the limits of the Districts, of which the following are the most important:—

In 1885 a hilly tract, triangular in form and 262 square miles in extent, was transferred from the Punjáb to the Kashmor Taluka of the Upper Sind Frontier District; but in 1889-90 nearly the whole of it (232·64 square miles) was re-transferred to the Punjab.

In 1883-84 the Sujáwal and part of the Kambar Talukas of the Shikárpur District, comprising an area of 620·04 square miles, were transferred to the Upper Sind Frontier and constituted the Shahdádpur Taluka. In 1901 an area of about 154 square miles was obtained from H. H. the Mir of Khairpur and added to the Sánghar Taluka by an agreement which was ratified on the 4th of March in that year. The object of this was to bring into British territory the head works and some portion of tho Jamrao Canal. The Khairpur State received an equivalent by the re-adjustment of its boundaries on the Indus. Between the years 1891 and 1901 Mirpur Khas Taluka, comprising an area of 562 square miles, was transferred from Hyderábád to Thar and Párkar District and a number of other changes were made in the Talukas on the border line between the Hyderábád and Thar and Párkar Districts, by which the former lost 124 square miles and gained 16 square miles.

Finally, the Shikárpur District having become too heavy a charge for one Collector, 7 Talukas (Ratodero, Lárkána, Kambar, Labdaria, Nasirábád, Mehar and Kakar) were detached from it, in August 1901, and combined with the Dádú, Johi and Sehwán

Talukas of the Karáchi District to make the new Lárkána District. At the same time the name of the Shikárpur District was appropriately changed to Sukkur, the head-quarters of the District having long before (in 1883) been transferred from the unhealthy town of Shikárpur to Sukkur.

Thus there are at the present time 6 Districts in Sind, of which 4 are under Collectors and 2 under Deputy Commissioners. The revenue administration of the District is entrusted to the Collector, or Deputy Commissioner, who as *ex-officio* District Magistrate is also the chief magisterial authority. He is also President of the District Local Board and District Registrar and may hold other appointments. The Collector's superior staff comprises Assistant and Deputy Collectors, the former being members of the Imperial and the latter of the Provincial Civil Service. Subject to the general control of their chief, the Assistant Collectors hold revenue and magisterial charge of portions of the District, called Sub-divisions, each comprising several Talukas. Of the Deputy Collectors one, styled the Huzur Deputy Collector, is usually in charge of the head-quarter treasury and account office, while another, the Daftardar, is the Collector's personal assistant for purely revenue business. Others may be put in charge of, or attached to, a Sub-division, to lessen the burden of work falling on the Assistant Collectors, or otherwise employed. For example, one of the Deputy Collectors in the Karáchi District is the Magistrate, Assistant Superintendent of Stamps and Income Tax Collector for the city of Karáchi. For administrative purposes the District is divided into Talukas and sometimes Mahals. Under the supervision of the Collector and his Assistants the revenue charge of each Taluka is in the hands of a Native Officer, the Mukhtyárkár, who, in addition to his revenue duties, has the custody of the sub-treasury established for his Taluka and exercises magisterial powers. The Mahal is presided over by a native officer of lower rank than a Mukhtyárkár, styled a Mahalkari, whose duties, though of the same character as a Mukhtyárkár's, are less onerous and responsible, his charge being small and his Magisterial powers usually only 3rd or at most 2nd class.

The following statement shows the manner in which Sind is at present divided for revenue administration :—

District.	Sub-divisions.	Number of Talukas and Mahals.	Officers in charge of Sub-divisions.	Other appointments of Deputy Collectors.
Karachi ...	1. Shahbandar.	4 Talukas.	Assistant Collector.	1 Huzur Deputy Collector.
	2. Tatta.	4 Talukas & 1 Mahal.	Assistant Collector.	1 Daftardar. 1 City Magistrate, Karachi.
	3. Kotri.	1 Taluka & 2 Mahals	Deputy Collector.	1 City Deputy Collector, Karachi.
Hyderabad ...	1. Hala.	4 Talukas.	Assistant Collector.	1 Huzur Deputy Collector.
	2. Tando.	4 Talukas & 1 Mahal.	Assistant Collector.	1 Daftardar.
	3. Naushahro.	5 Talukas.	Assistant Collector.	
Sukkur	1. Shikarpur.	3 Talukas.	Assistant Collector.	1 Huzur Deputy Collector.
	2. Rohri.	3 Talukas.	Assistant Collector.	
	3. Mirpur.	2 Talukas.	Deputy Collector.	1 Daftardar.
Larkana ...	1. Larkana.	4 Talukas.	Assistant Collector.	1 Huzur Deputy Collector.
	2. Sehwan.	3 Talukas.	Assistant Collector.	
	3. Mehar.	3 Talukas.	Deputy Collector.	1 Daftardar.
Thar & Parkar..	1. Nara Valley.	7 Talukas.	Deputy Collector.	
	2. Desert.	4 Talukas.	Deputy Collector.	
Upper Sind Frontier.	1. Upper Sind Frontier.	3 Talukas.	Deputy Collector.	

The actual collection of the land revenue is performed by Tapedars, each of whom is responsible for the revenue of a *Tapá* or group of *dehs* (villages) into which the Taluka is divided. The number of *dehs* in a *Tapá* varies from 4 or 5 to 9 or 10 and the number of *Tapás* in a Taluka depends on the number of *dehs*. Between the Mukhtyarkar and the Tapedars there is a staff of inspecting officers known as Supervising Tapedars, of whom there is one to every four or five ordinary Tapedars. More details will be found in the B Volumes.

OTHER DEPARTMENTS.

An account has already been given of the administration of the Judicial and Registration, Police, Education, Sanitary, Irrigation, Indus Conservancy, Forest, Postal and Telegraph departments in the chapters devoted to those subjects. The following remain to be noticed.

POLITICAL.

The Commissioner is in political charge of the Province. The Collector of Sukkur is the Political Agent of the Khairpur State. The Commissioner's personal staff consists of three Assistant Commissioners and an officer called the Mír Munshi. One of the Assistant Commissioners is a member of the Imperial Civil Service and is the Sindhi Translator to Government. Of the other two, who rank as Deputy Collectors, one is designated the Uncovenanted Assistant Commissioner and the other the Native Assistant Commissioner.

MANAGER, SIND ENCUMBERED ESTATES.

The circumstances which led to the creation of this appointment have been explained in Chapter VII. The Manager, who is a member of the Imperial Civil Service, has his headquarters at Hyderábád. He is directly under the Commissioner and has an Assistant and two Deputy Managers under him. The latter are appointed from the ranks of the Mukhtyarkars, one for Upper and one for Lower Sind.

COLONIZATION

Ths colonization of new lands on the Jamráo, Nasrat and Dád canals, described at page 415, Chapter IX, is controlled by a Colonization Officer under the orders of the Commissioner. He is a member of the Imperial Civil Service. He has under him an Assistant, who ranks as a Deputy Collector, and a Deputy, who is on the Mukhtyarkars list.

CUSTOMS AND SALT.

These two distinct Departments are at present under one officer, the Chief Collector of Customs and Collector of Salt Revenue, with two Assistant Collectors, who are both graded as Deputy Collectors. In both Departments that officer is subordinate immediately to the Commissioner in Sind, who is the Chief Customs Authority under the Customs Act and Commissioner under the Salt Act. As Chief Collector of Customs he controls the Custom Houses at Karáchi, Keti and Sirganda, and as Collector of Salt Revenue the saltworks at Maurypur and Dilyar and Saran (see Chapter IX). All matters, in short, connected with the issue of salt and the realisation of the duty on it are under him. But the establishment employed for the prevention of smuggling is under the District Collectors and Deputy Commissioners, who have been appointed Collectors of Salt Revenue for certain specified purposes. It is needless to say more about the Customs and Salt Departments here, as radical changes in the constitution of both are impending. It has already been men-

tioned in Chapter IX that the administration ot the Salt Revenue is to be entrusted to a separate officer immediately subordinate to the Commissioner, and the gradual introduction of an Imperial Customs Service for all India will sooner or later change the position of the Collector and assistant Collectors of Customs at Karáchi. At present the Chief Collector of Customs is also *ex-Officio* Shipping Master and it has been the practice to appoint him to the post of Vice-Chairman of the Port Trust.

EXCISE.

The arrangements at present in force for the collection of the duty on spirits, opium and intoxicating drugs, which are under the Collectors and Deputy Commissioners of the Districts, have been described in Chapter IX. They will be affected by the contemplated changes referred to above, as the intention is to place Salt and Excise under one administration and have one efficient preventive service for both.

PAPER CURRENCY.

The Paper Currency Department is under the Collector of Karáchi as Deputy Commissioner, with one Assistant Deputy Commissioner of Paper Currency under him.

STAMPS.

The Province used to obtain stamps from the Superintendent of Stamps and Stationery, Bombay; but in 1905 a stamp office was established at Karáchi for the supply of Sind, the Punjab, the N. W. F. Province and part of Rajputana, under the Collector of Karáchi as Superintendent and the City Deputy Collector as Assistant Superintendent of Stamps.

LAND RECORDS AND AGRICULTURE.

The only branch of this Department located in the Province is the office of the Superintendent of Land Records and Registration, Sind, which is at Hyderábád. It is at present engaged in preparing settlement registers and *deh* and Taluka maps.

MEDICAL AND JAILS.

Most of what is to be said of the Civil Medical Department has already been said in Chapter XIII. The head of the Department is the Surgeon General with the Government of Bombay. There are under him Civil Sergeons at Karáchi, Hyderábád, Sukkur and Shikárpur. The administration of the Jails in the Province, which, with the medical officers in charge of them, are enumerated in Chapter X, is under the Inspector General of Prisons, Bombay. The head of the Military Medical Department is the Principal Medical Officer, Karáchi Brigade, whose headquarters are at Karáchi.

ECCLESIASTICAL.

The Anglican churches in the Province are in the diocese of the Bishop of Lahore. There is a Senior Chaplain at Karáchi, with a Junior Chaplain to assist him when one can be spared. His charge includes Manora and Kiamari, but recently a clergyman supported by the Additional Clergy Society has been stationed at Manora to serve those places, who also pays periodical visits to the Persian Gulf. At Hyderábád there is a Senior Chaplain, whose ministrations extend to Kotri. Sukkur, Shikárpur, Lárkána, Jacobábád, Sibi and other places within these extensive limits depend upon a clergyman of the Additional Clergy Society stationed permanently at Sukkur. There is only one Chaplain of the Church of Scotland for Sind, who is stationed at Karáchi and visits Hyderábád, Kotri and Manora. The Roman Catholic Chaplains, of whom there are two, one at Karáchi and one at Hyderábád, belong to the Archdiocese of Bombay.

MILITARY.

In the time of Sir Charles Napier there were from 12,000 to 16,000 troops stationed in Sind, chiefly at Karáchi, Hyderábád and Shikárpur. Afterwards Jacobábád became a most important station, but the troops were by degrees withdrawn from all other places, except Karáchi and Hyderábád. Eventually the garrison of Jacobábád also was reduced to one regiment of the Sind Horse. By the new divisions introduced in 1904 Jacobábád passed into the 4th (Quetta) Division and ceased to belong to the Sind District, which at the same time became the Karáchi Brigade. The forces in the Karáchi Brigade are :—

At Karáchi—

1 Battery R. F. Artillery, 1 Company R. G. Artillery, 6 Companies British Infantry, 1 Regiment Indian Infantry, the Karáchi Artillery Volunteers, The Sind Volunteer Rifle Corps, a Detachment of the North-Western Railway Volunteers, 1 Mule Cadre, 1 Mule Corps, half a Troop of S. and T. Bullocks, 2 half Troops of A. T. Bullocks.

At Manora—

1 Company Sub-marine Mining Corps.

At Hyderábád—

2 Batteries R. F. Artillery, 1 Ammunition Column, R. F. Artillery, 2 Companies British Infantry, 1 Regiment Indian Infantry, a Detachment of the Sind Volunteer Rifle Corps and a Detachment of the North Western Railway Volunteers.

The Staff of the Karáchi Brigade consists of:—

At Karáchi—

Brigade Commander, Brigade Major, Staff Officer (1st Class), Assistant Commanding Royal Engineers, Principal Medical Officer, Garrison Engineer, Ordnance Officer, Officer Commanding Station Supply, Store and Shipping Officer, Senior Medical Officer, Senior Veterinary Officer, Officer Commanding R. G. A., Adjutant, R. G. A.

At Hyderábád—

Officer Commanding Brigade, R. F. Artillery, Adjutant, R. F. Artillery, Staff Officer (3rd Class), Senior Ordnance Officer, Senior Veterinary Officer.

There is a First Class Arsenal at Karáchi.

CHAPTER XV.

PLACES OF INTEREST.

This Chapter, as explained in the Preface, is relegated to the B Volumes. The following is a list of the places described, showing the Districts to which they belong:—

KARACHI.

Bhambor. Ruins.

Dhárájá (see Láhoribandar.)

Gharo. Village.

Jam-Tamachi-ji-Mari. Ruin.

Jerruck. Town and Buddhist ruins.

Jimpir. Town. Hindu temple. Musalman shrine. Khojas.

Jhok. Shrine of Shah Inayatullah Sufi.

Karachi. City, port, civil station and military cantonment. (Description, history, public buildings and institutions, &c.)

Keti Bandar. Sea port.

Kotri. Important town.

Kotri Allahrakhio Shah. Taluka head-quarters.

Ladiun. Taluka head-quarters. Shrine and fair at Sháh Yakik. Tomb of Aban Sháh.

Lahoribandar and Dhárájá. Ruins of town and fort.

Laki. Hot mineral springs of Dhára Tirth.

Manjhand. Taluka head-quarters.

Mirpur Bathoro. Ditto.

Mirpur Sakro. Ditto. Tomb of Shekh Háji Turábi.

"Mugger Peer." Shrine of Pir Mangho, crocodile tank and hot spring. Burfati tombs.

Mughulbin. Taluka head-quarters. Tombs of Mughal and Bhin and mosque. Great annual fair.

Pir Mangho. See Mugger Peer.

Pir Patho. Tomb and mosque and annual fair.

Rani-ka-kot. Talpur fort.

Rarhi. Ruins of town.

Shahbandar. A village, formerly a large sea port.

Sirganda. Sea port.

Sujawal. Taluka head-quarters.

Tatta. Taluka head-quarters and former capital of Sind. Two fine mosques, tombs on the Makli Hill and grave of Edward Cooke. Samui. Kalan Kot.

Thano Bula Khan. Mahal head-quarters.

HYDERABAD.

Badin. Taluka head-quarters. Ruins of old Badin. Shah Kadri fair. Pir of Badin.

Bhitshah. Tomb of Shah Abdul Latif.

Bulri. Tomb of Shah Karim. Great annual fair.

Daulatpur. Tomb of Nur Muhammad Kalhora.

Digri. Mahal head-quarters.

Hala. Taluka head-quarters, celebrated for glazed pottery and weaving. Tombs of Makhdum Nuh and Mukhdum Mir Muhammad.

Halani. A small village, the place of a great Hindu fair.

Hyderabad. City, civil station and military cantonment (History, description, public buildings and institutions, &c.) Mirs' tombs. Shah Makkai. Residency.

Kandiaro. Taluka head-quarters.

Khudabad. Tomb of Mir Fateh Ali Khan Talpur.

Matiari. Municipal town and chief seat of Matiári Sayads.

Matli. Taluka head-quarters.

Miani. Battle field.

Moro. Taluka head-quarters.

Nasarpur. Ancient town.

Naushahro Feroz. Taluka head-quarters.

Nawabshah. Ditto.

Sadaran-jo-thul. Old brick tower.

Sakrand. Taluka head-quarters.

Shahdadpur. Ditto.

Tando Adam. Large Municipal town.

Tando Allahyar. Taluka head-quarters.

Tando Bago. Ditto.

Tando Fazul. Ruins of Hingoráni.

Tando Muhammad Khan. Taluka head-quarters.

Thul Rukan. Old Buddhist tower.

Uderolal. Tomb of Uderolal, *alias* Shekh Tahir, the chief holy place of the Daryapanthis.

SUKKUR.

Aror (or *Alor*). Ruins of old Hindu town. Alamgirs mosque. Tombs of Shakar Ganj and Khatal-ud-din Shah.

Bukkur. See Sukkur.

Garhi Yasin. Taluka head-quarters.

Ghotki. Ditto. Musan Shah's masjid.

Hakrah. Ruins of an ancient town.

Khairpur. The capital of the Khairpur State.

Kot Diji. Town and fort in Khairpur State, the residence of the Mir.

Mirpur Mathelo. Taluka head-quarters. Ruins of ancient Hindu town.

Pano Akil. Taluka head-quarters.

Pír-jo-goth. Residence of the *Pir* of the "Hurs."

Rohri (also called **Lohri.**) Taluka head-quarters. *Wár Mubárak* (hair of Muhammad's beard). Jáme Masjid and other buildings. *Satbhain,* or Hill of the Seven Virgins. Island shrine of Khwája Khizr or Jinda Pir.

Shikarpur. Important town and formerly District head-quarters.

Sukkur. District head-quarters. (History, description, public buildings and institutions, &c.) Tower of Mir Maasum, tombs of Khair-ud-din, Adam Shah, &c. Bukkur. Sadh Belo. Din Belo.

Ubauro. Taluka head-quarters. Old mosque.

Vijnot. Ruins of ancient town.

LARKANA.

Bubak. A considerable town. Carpet making.

Dadu. Taluka head-quarters.

"Dana Towers." A proposed sanitarium. See Description of District.

Darhyaro Sanitarium. Ditto.

Dokri. Taluka head-quarters.

Johi. Ditto.

Kambar. Ditto. Tomb of Shahal Muhammad Kalhora.

Khairpur Nathan Shah. Taluka head-quarters. Tombs of Kazi Burhanudin and Nasir Muhammad Kalhora.

Khudabad. Ruins of town. Jáme Masjid and tomb of Yar Muhammad Kalhora.

Larkana. District head-quarters. Old fort and tomb of Shah Bahára.

Mehar. Taluka head-quarters.

Ratodero. Ditto.

Sehwan. Taluka head-quarters, Ancient fort. Shrine of Lal Shahbáz.

Warah. Taluka head-quarters.

UPPER SIND FRONTIER.

Jacobabad. District head-quarters. General John Jacob's house and grave.

Kandhkot. Taluka head-quarters.

Kashmor. Ditto.

Shahdadpur. Ditto.

Thul. Ditto.

THAR AND PARKAR.

Bhodesar. Buddhist ruins and a marble mosque.

Brahamanabad and Mansurah. A buried city, or citie known as Báhmanah. Depar Ghangro, a Buddhist *stupa*

Chhachhro. Taluka head-quarters.

Diplo. Ditto.

Gori. Remarkable and very old Jain temple.

Jamesabad. Taluka head-quarters.

Khipro. Ditto.

Mansurah. See Brahminabad.

Mirpur Khas. Taluka head-quarters. *Kahu-jo-daru*, a Buddhist brick mound.

Mithi. Taluka head-quarters. Ruins of two Talpur forts.

Nangar Parkar. Taluka head-quarters. Old Hindu temple, tanks and fort.

Pari-Nagar. See Virawah.

Pithoro. Tomb and place of a great fair.

Samaro. Taluka head-quarters.

Sanghar. Ditto.

Sinjhoro. Ditto.

Umarkot. District head-quarters. Ancient town and fort. Birthplace of Akbar. Mumal's *Mári*.

Virawah. A village at the ruins of a large town (Pári-Nagar) containing remains of Jain temples.

Forts at Islamkot, Ratakot and Nawakot, old town at Rahimki Bazar and other ruins of little interest.

APPENDIX.

KHAIRPUR STATE.

Additional Tables A to H in B Volume, Sukkur District.

The Khairpur State dates its history from 1783, when Mír Fateh Alí Khán, having finally expelled the Kalhorás, obtained a *sanad* from Kandahár which made him the titular ruler of Sind. His nephew, Mír Sohráb Khán, and a distant cousin, Mír Thára Khán, separated from him and asserted their independence, the former in Khairpur and the latter in Umarkot. They all continued, however, to act together in matters affecting the whole of Sind, and the Mírs of Hyderábád were recognised by the others as the leaders of the confederacy. Soráb Khán, by conquest or intrigue, gradually enlarged his territories until they extended to the Jaisalmer desert on the east and to Sabzalkot and Kashmor on the north. On his southern boundary he had the Mír of Umarkot and to the north-west he acquired a share with Hyderábád in the town of Shikárpur and the lands subject to it as far as the Kachhi. Sukkur and Bukkur were secured by Khairpur. The whole story of the events before and after the British conquest which brought the Khairpur State into its present political position has been told in Chapter III (pages 121 to 128 and 150, 151). It is now an independent state in subordinate alliance with the British Government. In 1866 a *sanad* was granted to the Chief under which the British Government promised to recognise any succession to the chieftainship that might be in accordance with Mahomedan law. In 1894 Mír Ali Murad, the chief who had been recognised at the time of the conquest, died and was succeeded by his son, whose full title is His Highness Mír Sir Faiz Muhammad Khán Tálpur, K.G.,C.I.E. He is now (1906) 71 years of age. The Collector of Sukkur is the British Political Agent.

BOUNDARIES AND AREA.

The limits of the State lie between 26° 10′ and 27° 44′ North Latitude and 68° 14′ and 70° 14′ East Longitude. It is bounded on the north-east by the Sukkur District, on the east by the

Jodhpur and Jaisalmer States, on the south and south-west by Thar and Párkar and the Hyderábád District and on the north-west by the River Indus. Its greatest length is 120 miles and its greatest breadth 70. Its area varies a little as the Indus gives and takes, but at present covers 6,050 square miles. Its population in 1901 was 199,313.

Within its limits there are three small "islands" of British territory, comprising the Tapas of Kingri and Manghanwáli (see Sukkur District, B. Volume).

DESCRIPTION.

The south-eastern half of the Khairpur territories is a portion of the desert which constitutes the Registán of the Sukkur District and most of Thar and Párkar and has already been described. Little cultivation is possible in this region, but it supports a shrubby vegetation which affords grazing to camels and cattle. The western and northern parts of the territory are similar to the adjacent parts of the Sukkur and Hyderábád Districts and very fertile where irrigated, *e. g.*, along the valley of the Eastern Nára and as far as the influence of the Indus and its canals extends. A noticeable feature of the country in the vicinity of Khairpur city is the prevalence of the graceful *táli* tree (*Dalbergia sissoo*). A range of hills which runs south from Rohri for about 18 miles in the Rohri taluka, rising to a height of 450 feet above the sea and 300 feet above the surrounding plain, continues in the same general direction for about 30 miles further after passing into the Khairpur State, where it spreads out to a width of 17 miles. These hills consist of nummulitic limestone of the Eocene age (see page 17) and are barren and forbidding, but in the distance form a pleasing relief to the flat landscape. There are no rivers in the territory except the small torrents which run down from these hills after rain, and the Eastern Nára, which is now a great canal rather than a river. The floods from the upper reaches of the Indus which, after traversing part of the Sukkur District, used to pursue their course along the valley of the Nára, have now to a great extent been restrained, or brought under control, and made to subserve the purposes of regular irrigation.

CLIMATE.

The climate is that of Upper Sind generally, very cold in the cold season, when severe frosts are not unknown, and very hot in the hot season, when the thermometer may rise to 120.° The

latter season begins about the end of March and the former in November. The rainfall has not been regularly registered, but cannot be very different from that of Sukkur, which averages 2·4 inches.

PRODUCTIONS. The fauna and flora of Sind have been described at some length in Chapter II and there is nothing very distinctive in those of this region. There are estimated to be 331 square miles of forest land in the State, of which 200 square miles are included in game preserves. They consist mostly of *bábul* and *kandi* and tamarisk. An establishment is maintained to look after them and a considerable revenue realised by the sale of firewood. In 1905-06 it amounted to Rs. 36,543. As has already been said, the valuable *táli,* or "sissoo," tree is common and the white poplar (*bahan*) is abundant near the river. Excepting building stone, of which the hills furnish an unlimited supply, the only minerals of any economic importance are fuller's earth (*met*), which is excavated in the hills, and carbonate of soda (*chaniho*), which is left by evaporation in many of the *dhands* in the desert. The latter is much purer than that found in most of the similar *dhands* in Thar and Párkar, containing only a small percentage of common salt; consquently large quantities are exported to British Sind and even to Bombay, and yield a good revenue to the State.

POPULATION. The population in 1872 was 126,962, in 1881 it was 125,919, in 1891 it was 128,611 and in 1901 it had increased to 199,313, giving a density of 33 to the square mile. The Hindus numbered 36,431 or 18·3 per cent. of the whole, and the Musalmans 162,848 or 81·7 per cent. There were 8 Christians and 26 of minor religions. Of the Hindus 32,617 were classed as Lohánas; but probably Kirâr Banias were included in these. Rájpúts, spoken of in the old Gazetteer as the principal Hindu inhabitants of the State, were found to number only 501 altogether. This, with the paucity of Hindus of the lower castes, throws some doubt on the completeness of the enumeration in the desert portion of the territory. Of the Musalmans a good proportion, as might have been expected, were found to be Baluchis (chiefly of the Rind, Burdi, Chándia, Dombki, Jatoi and Mari tribes), who numbered 23,806; but the bulk were Sindhis, consisting of Súmras, 12,167, Samás, 57,501, and "unspecified," 41,291. There were 12,093 *soi-disant* Arabs and 5,696 Muhánás. There was the same disparity of the

sexes which is found in the rest of Sind. The males numbered 108,766 and the females 90,547. Agriculture supported 138,140, or 69 per cent. of the entire population. At the time of the census 18,000 persons born in the Khairpur State were found in British territory, but only 9,000 aliens were found in the Khairpur State. The emigrants were probably for the most part seeking a temporary livelihood on railway and canal works. The population of the chief town, Khairpur, was 14,014. The people were distributed as follows in the five sub-divisions of the territory :—

Sub-division.	Villages.	Cultivated area in acres.	Population.
Khairpur	546	40,987	74,690
Gambat	657	36,049	67,607
Mirwáh	240	28,072	26,957
Wiho	185	28,924	15,135
Nára	567	1,251	14,924
Total ...	2,195	135,283	199,313

No survey or revenue settlement has been made in the State, but measures have recently been taken to demarcate the boundaries of villages, *jágirs*, forests and *shikárgáhs* and to prepare maps of them. This work has made some progress. The total cultivable area of the State is computed at 1,250 square miles, or about 800,000 acres, of which about one-fourth is lying waste. Of the remainder about one-third (206,819 acres) were actually under cultivation in 1905-06. The principal crops are *juári*, *bájri*, wheat, gram and other pulses and also cotton, tobacco and indigo, which last is more extensively cultivated in the State than in any part of British Sind and is exported. The cultivation and manufacture of opium and hemp (*bhang*) are allowed under restrictions, for the use of the Mírs subjects only. With the extension of irrigation and liberal treatment in the way of advances without interest for the construction of wells &c. cultivation appears to have made marked progress, so that the revenue from the land, which was estimated at only Rs. 4,28,243 in 1876, amounted in 1904-05 to Rs. 10,26,639 and in 1905-06 to

AGRICULTURE.

Rs. 13,26,816. The amount paid in takávi advances in the last ten years is shown below :—

			Rs.
1896-97	...	...	35,553
1897-98	...	...	48,054
1898-99	...	...	37,540
1899-1900	...	...	32,898
1900-1901	...	...	74,037
1901-02	...	...	43,610
1902-03	...	...	7,260
1903-04	...	...	23,428
1904-05	...	...	13,722
1905-06	...	...	17,906 in cash. 31,755 value of the advance in kind.

The irrigated part of the country is not directly exposed to famine, but during the drought of 1899-1900 the desert portion suffered terribly. Nearly all the cattle perished. Even in the western part the withering of the pastures caused much loss. The clearance and improvement of canals was taken in hand as a famine relief work and gave employment not only to the subjects of the Mír, but to refugees from Jodhpur and Jaisalmer.

The care of cattle, goats, sheep and camels is the occupation of a considerable proportion of the population, as in other parts of Sind, and the people of the desert tract are almost exclusively pastoral. Table A gives details of Agricultural Stock.

ECONOMIC CONDITION.

The difference in the land revenue system and the paucity of statistics make it difficult to compare the actual incidence of taxation with that prevailing in British Sind. The wages of day labour are nearly the same and forced labour has been abolished in the work of canal clearance. The general indebtedness of the *rayats* is described in the official reports of the State as distressing. Measures recently introduced to remedy this will be mentioned further on.

IRRIGATION.

Very little *báráni* cultivation is possible in the State, and though much has been done lately to encourage the digging of wells, cultivation must always depend mainly on canals. The principal canal is the Mír Wáh, excavated by Mír Sohrab, the founder of the State, on which the town of Khairpur stands. It leaves the Indus nearly opposite Sukkur and flows south, past Khairpur and Kot Diji, watering a large extent of country. A feeder to this,

named Sathio Wáh, and another canal, the Abul Wáh were made by the late Mír Ali Murád. Under the present ruler an Irrigation Department has been formed, which has improved the Sathio Wáh and constructed the following important branch canals:—Faiz Wáh, Faiz Baksh, Faiz Ganj, Faiz Bahár and Faiz Manj. The total length of these canals and their distributaries is about 300 miles and the area commanded by them amounts to 314 square miles.

COMMUNICATIONS.

During the rule of the present chief 305 miles of important road have been made. In addition to the main trunk road from Hyderábád to Rohri, which passes through Khairpur, and another road connecting the same towns by a more direct route, there are several roads connecting Taluka towns with Khairpur and Kot Diji. The portion of the North-Western Railway which traverses the State has the following five stations:—

Sethárja, Ránipur, Gambat, Tando Masti Khan and Khairpur.

Khairpur State has since 1897 been included in the Sind and Baluchistan Circle of the Imperial Postal Department, which has a Sub-Post Office at Khairpur and 9 Branch Offices at other towns. The State has the privilege of using Service stamps for official correspondence. The Railway Telegraph is available at the five stations.

TRADE AND MANUFACTURES.

The chief articles of export are grain, cotton, wool, hides, tobacco, indigo, coarse cotton cloth and carbonate of soda. The industries common to Sind are carried on in various parts, *e.g.*, hand-loom weaving, leather-working, pottery and brick-making; but two are always mentioned as deserving special notice, *viz.*, the manufacture of bed sheets (*khes*) at Gambat and the dyeing at Khairpur. The visitor is more attracted by the arts and industries which have been introduced or revived by the government and are thriving under its fostering care. One of the most interesting of these is the manufacture of pile carpets at the Giles Carpet Factory, which was established at Khairpur in 1900 and at which a hundred children are seen learning the beautiful art under teachers from Amritsar. The carpets are made after the Persian method, the pattern being written in a technical notation on paper, like a piece of music. The leader of the class, or rank, of boys holds the music and sings out each stitch in succession, on which each boy catches up the colour of wool indicated and passes it behind so many

threads of the warp, echoing the instructions at the same time. So swiftly does the work proceed that the hum of the choragus and his chorus go on without an interruption. Aniline dyes are avoided in this factory. Lacquer ware, enamelled tiles and silk embroidery are taught also at the Technical School at Khairpur. The lacquer ware is superior to anything of the kind procurable elsewhere in Sind. The process is described at page 397.

REVENUE. The land revenue system is that which prevailed before the advent of the British. The state takes its dues in kind by "battai", and it is claimed that the people prefer to give it so. The cultivator makes three heaps of his grain, whether the harvest has been good or bad, and the State agent takes one. There are few large proprietors, so the peasant holder usually gets the other two heaps to himself. The average value of the State share is said to be Rs. 5-8-0 per acre of cultivation. This system opens many paths to peculation, to reduce which some reformation of methods has recently been attempted with promising results. Large State granaries have also been built at some of the Railway Stations to hold the government share of the produce until it can be advantageously sold. A cash assessment has been adopted for special reasons in the case of oil seeds, pulses and some other crops. The annual revenue of the State for the past ten years is shown in table B.

The principal sources of revenue are Land, Rs. 15,52,915 (in 1905-06), Forests, Rs. 36,543, Excise fees (License fees for country liquor and *bhang*), Rs. 54,966, Criminal Fines, Rs. 11,359, Fisheries, Rs. 10,299, Hide licenses, Rs. 11,336, Salt Rs. 42,740, Land Customs, Rs. 50,979. Of the land revenue Rs. 2,26,099 represent the shares of jágírdárs and other alienees, but this appears also on the expenditure side. No salt is made (licitly) in the State, but the quantity required by the Mír's subjects is supplied to him annually from British Saltworks at cost price and the Mír levies thereon a duty sufficient to equalise the selling price with that prevailing in the adjoining British Districts. General Administration, Public Works and Police, Personal Expenses of His Highness, Maintenance of the members of the Ruling Family and Expenses incurred by His Highness to maintain his Dignity, are among the largest items of expenditure.

ADMINISTRATION AND JUSTICE.

Long after British rule had begun to transform the rest of Sind the traditional methods of the Talpurs continued without change in the Khairpur State and Sir Bartle Frere has given a very dark picture of their effects on the subject as he saw them in the districts resumed by the British Government in 1851. "Anything more wretched," he writes, "than the present state of its inhabitants I never beheld." Under the rule of the present chief and the enlightened guidance of its two last Vazirs* the State has seen great changes and even the account of it given in the old Gazetteer of Sind is in many points no longer applicable. The Mír himself is the head of the State and has the power of life and death over his subjects. Under him the Vazir, an officer lent from the British service, conducts the general administration and has the powers of a District Magistrate and District and Sessions Judge. Two Náib Vazirs under him are in charge of the two Sub-divisions of the State and a Mukhtyárkár is appointed to each of the five Talukás, which are the following:—

Khairpur Sub-division,—Khairpur, Gambat.

Mir Wáh Sub-division,—Mir Wáh, Faiz Ganj, Náro.

The Naib Vazírs are Sub-divisional Magistrates and First Class Sub-Judges and the Mukhtyárkárs have also criminal and civil powers. These are exercised also by two near relatives of the Mír. The Indian Penal Code and the Criminal Procedure Code are in force and other British enactments are introduced. With the view of reducing litigation some classes of civil suits are first brought before a council of village headmen, in the presence of the Mukhtyárkár, and either compromised, or submitted to arbitrators, if the parties consent. The decision of arbitrators has the force of a civil judgment, without any charge for court fees, which is an inducement to suitors to settle their claims in this way. Several measures have also been introduced lately for the relief of cultivators. These are, making the registration of sales, mortgages and leases of immoveable property compulsory, giving the courts power to go behind a bond and inquire into the history of a debt, abolition of imprisonment for debt, prohibiting the summoning of a *rayat* during the four busiest months of cultivation, prohibiting the sale of land in execution of

* Khán Bahádur Kádirdád Khán, C.I.E., and Sardar Muhammad Yakub, C.I.E. The latter distinguished officer died while this Gazetteer was going to press.

a decree, and the introduction of an Agriculturists Relief Act. The working of the Criminal and Civil Courts and the Registration Act are exhibited in Tables C. D., and E.

POLICE. The total strength of the Police force is 216. It is under a Názim of Police assisted by an Inspector. Of the rest 38 are petty officers, 55 sawárs, 11 camel sawárs, 91 constables and 19 munshis. Thirty-one selected men are armed with smooth-bore carbines and the rest with swords. The village headmen are supposed to do some of the duties of village Police. Theft and Misappropriation of Property and Hurt and Criminal Force and Assault make up a very large percentage of the offences recorded.

ARMY. The State army consists of 208 Regular Infantry, 153 Irregular Cavalry and 4 Artillery. The Infantry are employed on the duties of armed Police and also supply a band and pipers, the Cavalry do escort duty and attend upon the Mír, &c. and the Artillery are kept for firing salutes. A branch of the St. John's Ambulance Society has made some progress.

JAILS. There is a Central Jail at Kot Diji and a Sub-jail at Khairpur. The average number of prisoners in these during the last three years was :—

1903-04	...	...	213·75
1904-05	...	...	206·42
1905-06	...	...	195·85

EDUCATION. Education, though still in a backward condition, has made gratifying progress, as Table F will show.

The figures in the Table are in one respect misleading. A large number of institutions which used to be classed among the primary schools were only so-called schools kept by *Mullás* in the mosques. These are not now entered in the official returns, consequently the number both of schools and mosques appears to have declined since 1902-03, which is not actually the case. The decline really marks an improvement in the educational system. There were in 1905-06, 1 Secondary Anglo-vernacular School, 60 Primary Boys' Schools, 7 Primary Girls' Schools, 32 Aided Mosque Schools and aided Hindu-Sindhi Schools; also one aided Anglo-vernacular (secondary) School and one aided Primary, one Arabic and one Technical School at Khairpur. The Technical School is an

institution of which the State is justly proud. The boys, besides getting an elementary education in reading, writing and drawing, are taught carpentry, smithery, turnery tailoring and the arts of embroidery and lacquering already mentioned above. The Giles Carpet Factory is virtually a branch of this school. The Anglo-vernacular School, which was started in 1904, grew out of the Technical School and is associated with a Boarding House for the accommodation of Musalman boys of respectable families. Here the boys are kept under supervision. In this there were 51 boarders in 1905, of whom 27, natives of the State, were boarded free, while 24, mostly natives of British Districts, paid the boarding fee, which averaged Rs. 4-8-0 a head per month. Attention is paid to religious instruction and physical training. Besides the boarders there were 57 day pupils in the School, the majority of whom were Hindus. The total cost of education, to the State, in 1905-06 was Rs. 35,710.

HEALTH.

The State maintains 3 Hospitals and 4 Dispensaries, at none of which any charge is made. Table G shows the work done at these. The cost of maintaining these institutions averaged Rs. 18,000 during the last three years. There is also a Veterinary Dispensary at Khairpur, at which 5,733 animals were treated during the year 1905-06. Five vaccinators are employed, whose work during the past 10 years is exhibited in Table H. The registration of births and deaths is attempted through the agency of Tapedars, Pound Munshis and the Police.

Some other useful institutions are maintained. For the encouragement of horse and mule breeding two horse and three donkey stallions are kept at different places. Till 1852 the State maintained a mint and its coins (known as "challan" coins) were current until 1903, when they were called in and melted. Only British coin is recognised now.

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